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The OIL WEEKLY and The COMPOSITE CATALOG for the drilling-producing-pipeline industry

PETROLEUM REFINER and The REFINERY CATALOG for the refining-natural gasoline industry

☆

LOOKING AHEAD
... with the Editor

WHAT will happen to consumption of petroleum products in postwar days, and what influence will cessation of the enormous military demand have on production rates are related subjects becoming of greater interest to every oil producer as events presage the end of the war.

THE OIL WEEKLY staff has been engaged in such a study, and will present its conclusions in the next issue. The forecast will differ somewhat from several other studies of this subject that have been presented recently, in that it will stress probable production rates more than overall demand for petroleum products. Hence, it is written especially for producers of crude oil and natural gasoline.

THE OIL WEEKLY

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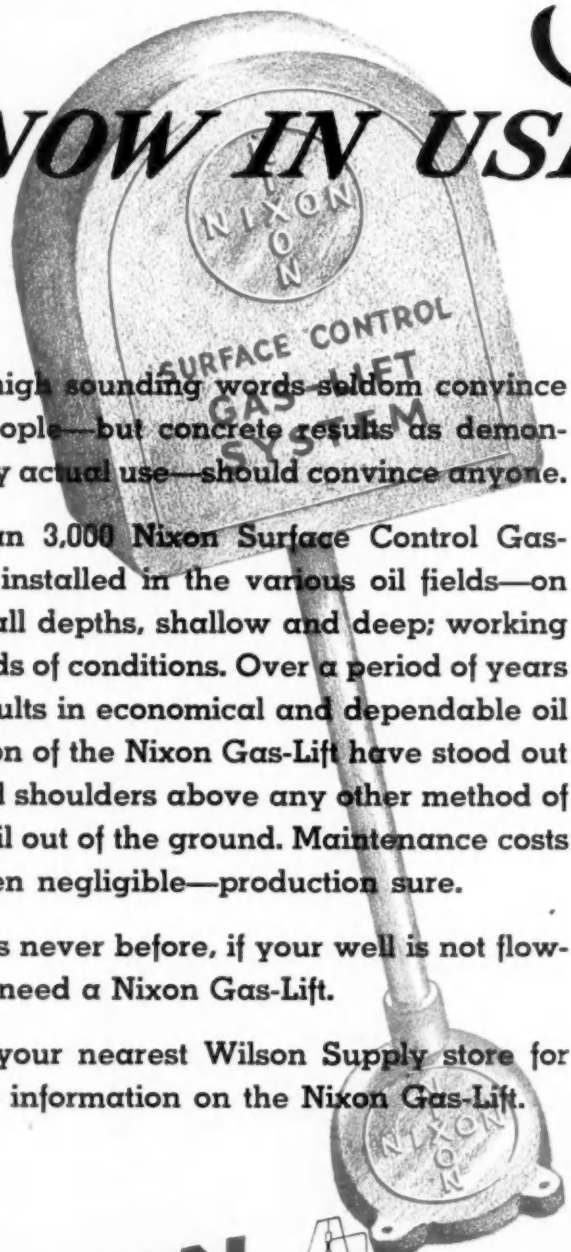

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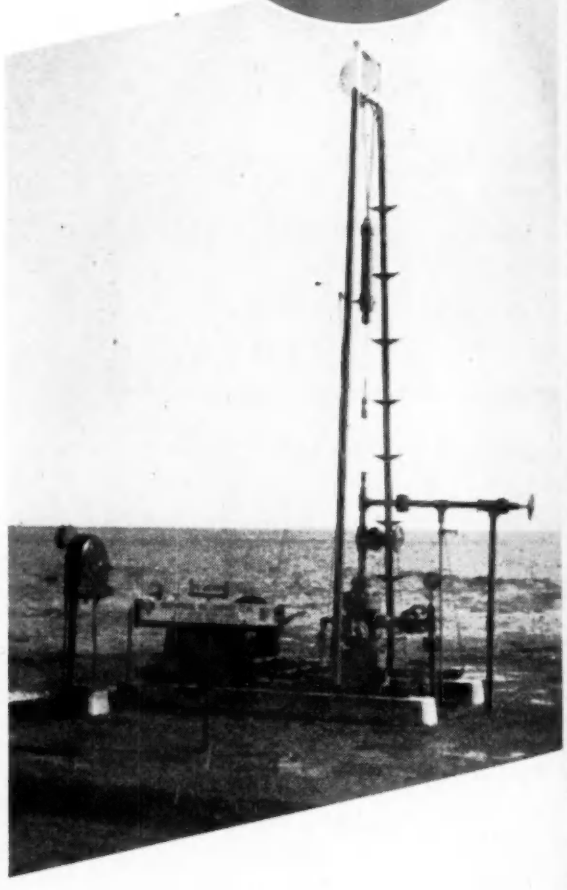

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The Changing Panorama

Airplanes Need Much Lubricating Oil Too

WITH Allied air power striking on all fronts, consumption of high-grade engine lubricating oil, as well as the more publicized aviation gasoline, by the air forces is running at peak levels.

Right now the United States Army Air Force Air Service Command is doling out aviation engine oil at the rate of more than seven million gallons monthly. About one third of this allotment goes overseas in drums and smaller containers. The rest remains at home for training and transport purposes. An estimated additional three million gallons a month is being supplied our airmen in overseas theaters from Navy bulk shipments, from lend-lease common stock pools, or from reverse lend-lease.

To help supply the needs, the Air Service Command early in 1943 set up a program for the reprocessing of used aviation engine oil. That program now is producing 900,000 gallons a month of oil that comes up to specifications. Reprocessing serves three purposes: (1) saves many high-grade components of aviation oil, which means the conservation of critical materials; (2) Releases more new oil for combat planes overseas, since it is used in the United States; and (3) saves the United States government an average of 16 cents a gallon on what it costs to buy new oil.

While reprocessed oil accounts for only about one fifth of the oil that goes into Army planes in the United States, it has helped solve a serious difficulty in transportation. Two of the principal training areas in the United States—California and Florida—produce no oil of aviation lubricating quality. Without reprocessing, California would have to send 1500 miles for its supply from the Texas Gulf or Oklahoma areas, while Florida would have to ship from 1000 miles away. Reprocessing plants at Los Angeles and Miami have helped relieve the problem.

Americans naturally believe that if all nations were to do away with artificial restraints on production and distribution except those dictated by principles of orderly development of natural resources and prevention of waste, a general stimulation of economic progress in all parts of the world would result.

—RALPH W. GALLAGHER,
President, Standard Oil Company,
(New Jersey).

Machinery for World Oil Cartel

SEVERAL years back the President of the United States came home from his first conference with the British Prime Minister and spoke in high praise of The Atlantic Charter, which made plain its attitude of "equal access" to raw materials.

The Atlantic Charter never went before the United States Senate for consideration and in time most of the citizens of the United States came to look upon it as a collection of high-sounding phrases, without force and effect. In fact, the British Prime Minister issued some statements which were accepted as cutting the document into several parts.

Then in July, 1944, representatives of the two governments met in Washington to consider collaboration in affairs of oil and the references to the Atlantic Charter were sufficient in number to justify the suspicion that the Atlantic Charter is something more than an assortment of high-sounding phrases. At least it became the justification and the precedent for a conference, out of which came an agreement for setting up an International Petroleum Commission.

Now men in government as well as in the industry are classing this agreement as another assortment of high-sounding phrases, without force and effect. They raise the point that this agreement must go before the United States Senate, whose approval can give it force and effect. But the Atlantic Charter never had Senate blessing and it had sufficient force and effect to be used as justification for an agreement as to petroleum.

In the Atlantic Charter raw materials came in for an "equal access" attitude, which came to be accepted in many quarters as evidence that the two great powers were, to whatever extent the Atlantic Charter had force and effect, pledged to "free trade."

But the agreement as to a commission to direct the affairs of petroleum came to this grand purpose, so that:

"Adequate supplies of petroleum be available in international trade to the nationals of al peaceable countries at fair prices and on a non-discriminatory basis."

To whatever extent interpretations are accurate, it would seem that the "free trade" foundation has been used for a program whereby a commission will favor peaceful nations on a "non-discriminatory basis."

This agreement has been signed by Lord Beaverbrook for the British government and by E. R. Stettinius, Jr., Acting Secretary of State for the United States. Whether it ever goes to the United States Senate for ratification as a treaty or simply stands as a document of merit by its content is a question which the men and women of the petroleum industry should help to answer. Regardless of what course the agreement takes, it is going to have influence on the jobs and investments of the petroleum industry.

No commission can be successful in manipulating the affairs of international petroleum unless it has some authority over domestic petroleum affairs. Thus far all manner of meanings are being read into the agreement. Some are inclined to dismiss the document as without force and effect, simply because it is made up of high-sounding phrases. This attitude is not safe, as the influence of the Atlantic Charter indicates.

This International Petroleum Commission is charged with the responsibility of determining world markets and directing the distribution of oil accordingly. In order to accomplish this, it may come about that the total out-

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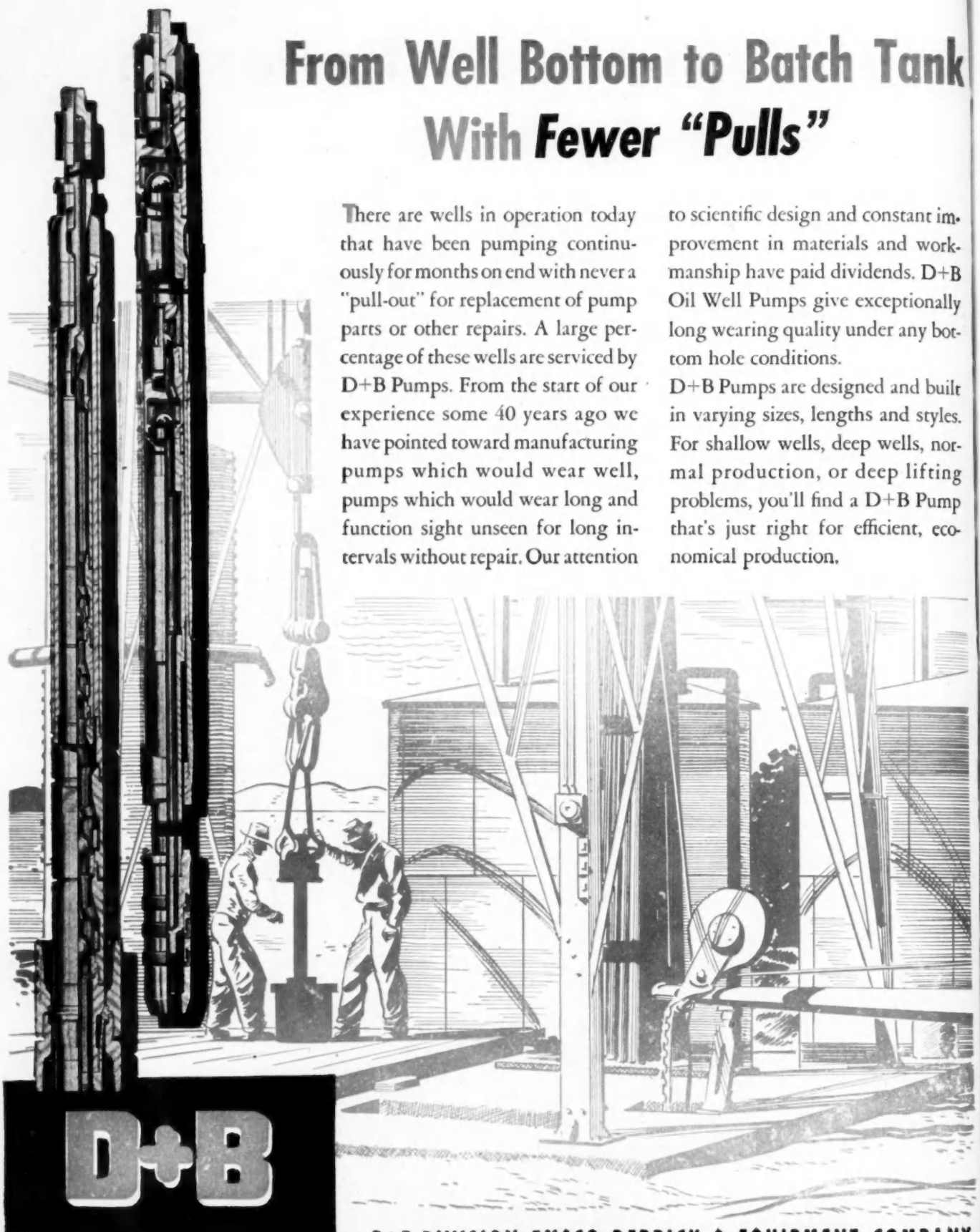

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put of a nation, the United States as logically as any other, would have to be reduced. When and if this commission can bring that about, its action will have influence on the jobs and investments of those who make up the industry.

Reading meanings into the agreement goes on without hindrance and here is one for consideration: It would make petroleum supplies available to nationals of "peaceable countries." Evidently this commission would be expected to determine the attitude of a nation as to war and peace and allot oil supplies accordingly. In such oil would become the raw material for keeping the peace of the world. It could be provided on condition that a nation remain at peace.

It should be remembered that gasoline was shipped to Japan on somewhat the same basis in the months previous to Pearl Harbor. The petroleum industry has been condemned repeatedly for supplying gasoline to Japan. Few remember that those shipments went forward with the approval of the State Department.

Deceit under an International Petroleum Commission could be as successful and as deadly as it was under the watch of our State Department.

The petroleum agreement is in effect the machinery for a world-wide cartel in oil. It does seem peculiar that an administration, which has been so persistent in its condemnation of private cartels would at the same time sponsor one, whose effect can be as destructive as any of private building.

"The only thing that can prevent our country from having abundant liquid fuel for many generations, and at reasonable prices, is interference with the free play of technology and competitive enterprise.

"The most serious and imminent danger to the future of the industry is not the possible shortage of satisfactory raw materials, but certain threats to the future of the very research and technology which is the multiplier of our natural resources.

"Were it my job as a super-saboteur to destroy America's greatness, I can think of no more effective way than to destroy our present patent system. The tragedy is that if we permit impractical theorists and faddists to distort the facts and hypnotize the nation into such an act of hara kiri, as they are now trying to do, all of us will suffer—yet no adequate punishment can be meted out to those really responsible."

DR. ROBERT E. WILSON, President Pan American Petroleum & Transport Company in Chemical & Engineering News.

Rehabilitation Of Veterans

THE foremost objective of management in the rehabilitation of veterans is the special training of foremen for the role they must play, as summed up by the Committee on Supervisory Relations, of the National Association of Manufacturers. The supervisor is perhaps the most important factor in the satisfactory reabsorption of veterans in industrial jobs, particularly during the first few weeks of their change-over from military to civilian life. Management must give its foremen as much preparatory information and guidance as possible in order to help the foremen develop the right attitude and a better understanding of how to deal soundly with veterans. The committee suggests that management provide its supervisory personnel with some training and information on these specifics:

The employer's legal obligations, such as Section 8 of the Selective Service Law, particularly those provisions which relate to the veteran's rights to his former job.

Effect of Section 8 on the seniority practices of industry generally, along with the company's stated and contractural seniority practices.

The "G.I. Bill of Rights," its provisions, and the various benefits it grants veterans.

The company's in-plant veteran employment program, especially as it concerns veterans who were former employes, veterans who are now employes but have had experience in similar work, and veterans who are being employed for the first time and need "indoctrination" into industry.

Human and technical problems, stressing the foreman's friendly understanding of the fact that the veteran is eager to succeed on the job and the fact that it is the foreman's duty to see that the veteran is given the full benefit of assistance from both the personnel and medical departments in order to fit smoothly into his working life.

Physically handicapped need proper placement and, fitted into the right job, properly trained, they are wholly productive. Veterans still undergoing medical treatment should have their time arranged so that they may continue any treatments necessary to bring them back to normal health.

"I abandoned Kansas in my quest of oil fields: but while I searched in far places, Kansas' own production increased nearly a hundred-fold. It is a little humiliating to the geologist, engaged over 30 years in search of oil, half way round the earth, to learn upon his return at length to his birthplace that oil is gushing from all the farms in the neighborhood."

OIL IN THE EARTH, *by Wallace E. Pratt*

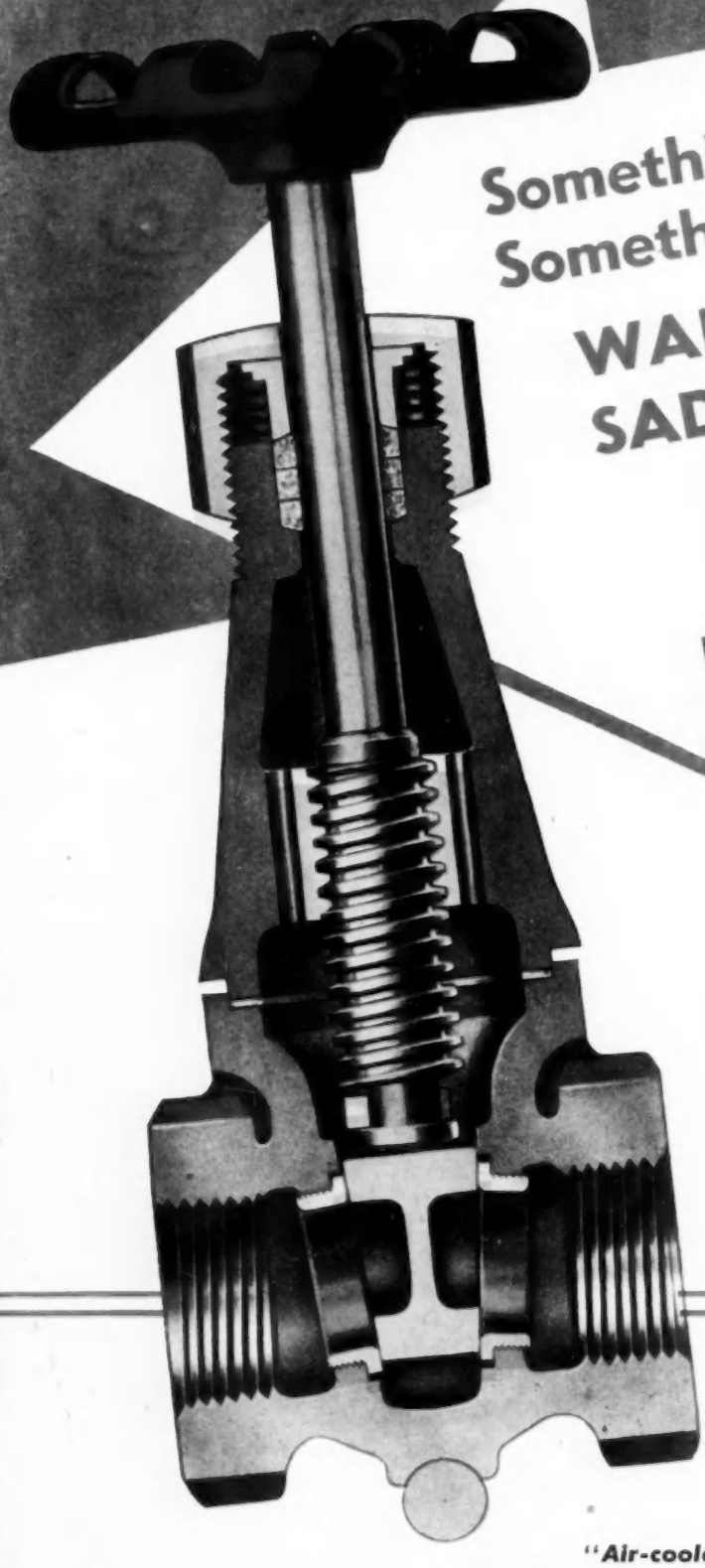
Recruiting May Solve Man Power Problem

IT HAS long been the custom, in many drilling areas, for a driller to be picked out by the contractor, and the former then given more or less a free hand in the rounding up of his crew or tour fellow workers. Not only is the basic teamwork better, but there is also a keen desire on the part of the driller to keep his crew intact and to check personally into any absenteeism or malingering which may show unfavorably against the tour's record.

While this system of assembling working crews is not readily adaptable to other oil field operations — even though many maintenance gangs are likewise firmly knit through the influence of the gang pusher — it is possible that an adaptation of the plan now successfully in use on the West Coast for obtaining shipyard workers might prove equally satisfactory in building up the crews of trained men soon to be absolutely indispensable if the oil industry is to maintain the pace demanded of it. The "war bond tip plan," as it is designated, consists basically in the awarding of a $25 War Bond to any employe of the plant who shall bring in a new worker who must comply with two conditions before the recruiter obtains his reward. The new man must prove suitable after having passed the screening of hiring tests, and he must remain in the employ of the shipyard for a period of 90 days. Upon the completion of the second condition the bond is issued to the employe bringing in the newcomer.

Records from two yards utilizing this recruitment-bonus plan show that at one 33 percent, at the other 26 percent of the new workers brought in stuck to the job and qualified the "contact men" for the war bond award.

The $18.75 purchase price of the new bond is small charge when offset against the finding of a man qualified to fill any of the many man power vacancies now hampering each of the various phases of the oil industry, and the cost of such recruiting plan is quickly amortized by the increased activity of the work into which the new man is inducted. Rather than wait for the uncertain and spasmodic trickle of men back from the shipyards, munitions plants and other war industries, the oil industry can hasten preparations for all-out activity through adoption of methods such as this one, even though it may depart radically from the dog-house and tool-house doorstep hiring-and-firing of the past.



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- 225 lbs. screwed ¼" to 2"
- 175 lbs. screwed 2½" to 4"
- 200 lbs. flanged 1" to 2"
- 175 lbs. flanged 2½" to 4"

Service steam pressures:
- 150 lbs. screwed ¼" to 2"
- 125 lbs. screwed 2½" to 4"
- 125 lbs. flanged 1" to 4"

Note the two drain holes inside the bonnet, minimizing the risk of damage from freezing. Figure 709, Bronze Mounted.

"Air-cooled" non-heating hand-wheel permits safe, sure grip.

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WASHINGTON ROUNDUP

By BERTRAM F. LINZ, Washington Correspondent

CONGRESS and the administration last week were engaged in a race against time, seeking to build a firm foundation for postwar reconversion before the fall of Germany.

Stockpile Inventory—War Production Board division directors were asked to re-examine their stockpile and public purchase programs and to review their estimates of proper reserve stocks, with a view to cutting down the stocks which will become surplus with the cessation of hostilities in Europe.

WPB Permits Changes—First step toward the de-control of industry was taken during the week, when the WPB wiped out restrictions on colors and styles of footwear. Rationing of shoes will continue but manufacturers are left free to produce new models, so long as they do not require additional labor to do so. Similar orders, officials promised, will follow for other commodities as rapidly as changing conditions make them possible.

Big Surplus Problems—Disposition of synthetic rubber and aviation gasoline facilities, the two big pipe lines and lands overlying possible oil or mineral deposits continues to offer one of the biggest problems in the writing of legislation for the disposition of surplus government property on which congress is working. Indications are that the plants and pipe lines will be disposed of only after Congress has had an opportunity to act on plans submitted by the disposal agency which is to be set up to handle surplus properties, while the disposal of land may be centralized in the Interior Department and Department of Agriculture.

Charge Rate Agreement—Major oil companies operating western pipe lines were charged by the Department of Justice with having entered into rate agreements with the western railroads whereby, in return for keeping pipe-line rates at a parity with the rail rates for long hauls, they received reductions in rates for short hauls from their refineries and terminals. In an anti-trust suit filed in the federal district court at Lincoln, Nebraska, the Department charged that this was one of a number of arrangements which the railroads had entered into to discourage competitive freight services. With the exception of Standard Oil Company (Indiana), however, none of the companies participating in the agreement were named nor were any of the companies or their executives cited as defendants in the case.

Spacing Rules Eased—Continuing its program to ease spacing regulations to encourage increased development, PAW during the week issued another supplementary order to PAO-11, under which the spacing of wells in 42 Texas counties will be governed by the depth of the productive formation to which they are to be drilled and permitting wells to be drilled to any one of several depth ranges without regard to wells in the same field drilled to other depth zones.

Consider Oil Pact—The Senate foreign relations committee met twice during the week to consider the Anglo-American oil pact, but Chairman Tom Connally said only that members talked about the agreement and would not say that they had decided whether it would have to be ratified by the Senate. But President Roosevelt cut the gordian knot August 24 by sending the agreement to the Senate in the form of a treaty requiring ratification.

Want Oil Representation—A group of oil executives meeting in New York have served notice that the oil industry will demand seats on the joint commission provided in the recently adopted Anglo-American oil agreement.

Further WPB Changes—The WPB also lifted the dollar quota restriction from the purchase of chemicals for laboratory use, and assigned an AA-2 priority rating to persons in the business of conducting scientific or technological investigations to buy materials, and gave AA-1 rating for reagent chemicals to laboratories holding a serial number, permitting the purchase of reagent chemicals under such ratings without any limitation as to quantity. Butadiene and styrene were removed from allocation control, indicating that the supply of these important synthetic rubber components now was adequate for all foreseeable needs.

American Oil Industry to Demand Seats on World Joint Commission

The critical stage of world oil accord negotiations has not yet developed, no matter how altruistic may have been the intentions of those who wrote and signed the preliminary United States-British oil agreement as announced on August 8, according to a number of executives of American oil companies who are qualified to speak for the industry.

A group of these executives in New York on August 23, initiated a drive to unite all American companies operating in foreign countries, on the assumption that the real test in the regulation of world oil supplies will come when the four American and four British members of the proposed joint commission get together and prepare the recommendations that are more or less assured of adoption by the two governments.

These oil executives insist that the American oil industry must be adequately represented on the eight-man joint commission, and they intend to do their utmost to see that American oil interests act as a unit to exert the pressure required to accomplish that goal. They feel that otherwise, all four American representatives are more than likely to be selected from the staffs of government departments or agencies, thus assuring postwar continuance of governmental control of the industry without proper recognition of the rights and well-being of private enterprise.

British Delegation

It is an open secret that the British government will name three men from the industry and one from government to act for their nation as members of the all-powerful commission. It is held that our government should

proceed similarly in selecting its representatives and that in no event should less than two of the United States members be appointed from the industry.

Only thus, the New York "steering committee" points out, will the American petroleum industry and the American public be assured that their rights and interests will be properly served and protected. There is needed, they say, competent counsel of responsible, experienced and realistic men, who will be alert and supremely zealous in making absolutely certain that "adequate supplies of petroleum shall be available in international trade to the nationals of all peaceful nations, at fair prices and on a non-discriminatory basis"—and at the earliest possible date.

The New York leaders may later formally suggest several alternative methods by which the industry can obtain the representation it desires at the conference table. They would prefer that the members be selectd from a larg group to be nominated by all interested American foreign oil operators. It may also be suggested that Congress authorize the formation of an American oil industry board of governors, having full power to direct the activities of our four commissioners. Whatever the method of selection or supervision, though, the American companies are determined to insist on having a strong voice in the negotiations.

Worldwide Cartel?

The recent letter written by J. Howard Pew, Sun Oil Company president, to Senator Tom Connally, chairman of the Senate Foreign Relations committee, has aroused considerable comment. In particular, discussion, pro and con, has been provoked regarding his charge that the preliminary Anglo-American petroleum agreement represents what might easily be interpreted as a first step toward a super-state cartel which would be the antithesis of the American competitive system.

Most leaders of the industry profess to hold a more optimistic view of the true objectives of the agreement, although they freely admit that its general terms and platitudinous phrases might mean everything or nothing with respect to an ultimate commitment by our two nations that will effectually prevent an international scramble for the world's oil fields, and that will remove obstacles to the free flow of trade while protecting all legitimately acquired rights.

Action Called For

"After the brawl is over" neither the oil industry nor any other major American industry will subscribe without protest to any kind of bureaucratic control of international commodities. Rather, their postwar plans are founded on the expectation of free world markets with free prices.

The fears of Mr. Pew may or may not be justified in the extreme, but his peers in the industry have been quick to point out that his pronouncement calls for immediate and united action by the entire industry which he represents.

The challenge to American operators of foreign properties is clear. It now remains for them to get together and get busy—in Washington.

Only Few Problems Encountered in Administering Stripper-Well Subsidy

Declaring that fewer problems than anticipated have so far arisen under the stripper-well subsidy plan, OPA officials this week said that the only outstanding question now before them is in the handling of the subsidy in Kentucky, where all pools, with a number of specified exceptions are receiving the 35 cent rate provided for pools having a production of less than five barrels daily per well.

While most of the pools now receiving this rate are believed to be entitled to it, OPA is investigating to determine whether other pools may not be eligible only for the lower rates of 25 cents per barrel for production between five and seven barrels daily, or 20 cents for seven to nine barrels.

Officials of the agency met with representatives of the Kentucky industry last week to discuss the situation, arising largely out of the lack of accurate information regarding operation of the various pools.

One of the factors influencing the inquiry is recent reports of new discovery wells with a relatively high rate of flow, and a survey is being made to determine whether any of these wells are located within the old stripper areas now receiving subsidy payments.

It was said at OPA that a number of replies already have been received to the letter recently sent out to purchasers of Kansas and Oklahoma crude, requesting information to aid in determining whether specific dollar-and-cent ceiling prices should be established for the various degrees of gravity for oil produced in those states (THE OIL WEEKLY, August 21).

Information thus far, it was said, indicates that little oil is bought below 29 degrees, but no definite conclusions will be possible until all sections of the two states have been heard from.

Additional changes in the list of pools eligible for subsidy are now under consideration in OPA, including the following:

Add: Illinois, Maud pool, (Wabash County) 25 cents. Indiana, Oatesville (Pike) 35 cents; West Princeton (Gibson) 35 cents; Bowman (Pike) 35 cents. Kansas: Atyeo (Lyon) 35 cents. Michigan, South Adams (Aranac) 35 cents. Oklahoma, Canfield (Pawnee) 35 cents; Huffman (Potawatomie) 35 cents; Lookout (Osage) 35 cents; Piggot (Osage) 25 cents; Wilson (Pawnee) 25 cents; Wood (Creed) 25 cents. Correct: Kansas: "Los Springs (West)" should be Lost Springs, East; "Pippes" should be Pixlee.

Spacing Regulations for Texas Counties Changed

Simultaneous development of overlying oil pools in 42 counties in North and West Central Texas has been made possible through modification of well-spacing regulations in supplementary order 14 to PAO 11, issued by PAW August 25.

Removed from the provisions of supplementary order 8, which hereafter will apply only to designated areas in Oklahoma and Kansas, drilling operations in the 42 Texas counties, where in some localities there are two or more producing formations at different depths within a single field, will be subject only to spacing regulations for particular depths without regard to wells drilled to other depth zones.

Under the new order, 5-acre spacing is provided for wells drilled to not exceeding 1400 feet; 10-acre spacing between 1400 and 2500 feet; 20-acre spacing between 2500 and 3400 feet, and 40-acre spacing for wells deeper than 3400 feet. The order leaves to the state regulatory body the requirements as to distances between wells and the distance of wells from property lines.

PAW officials expressed belief that the changes in spacing requirements will encourage drilling of additional wells and result in increased production in sufficient quantities to justify the expenditure of material and manpower required.

The counties affected by the order are: Archer, Baylor, Brown, Callahan, Clay, Coleman, Comanche, Concho, Cooke, Coryell, Denton, Eastland, Erath, Fisher, Foard, Grayson, Hamilton, Hardeman, Haskell, Hood, Jack, Jones, Knox, Lampasas, McCulloch, Mills, Montague, Nolan, Palo Pinto, Parker, Runnels, San Saba, Shackleford, Somervell, Stephens, Stonewall, Taylor, Throckmorton, Wichita, Wilbarger, Wise, and Young.

New Price Maximums for California Pools Listed

Revised maximum price regulations for California stripper wells went into effect August 1 under an OPA order.

Pools affected and the amount of dollar increase per 42-gallon barrel are as follows.

Belridge South, Middle Belridge Area, (Shallow)	25
Kern River (All Pools)	35
McVan, Poso Creek District	25
Pyramid Hills	20
Sunset, Mt. Poso District	25
Temblor Ranch, McKittrick District	35
Wasco (Shale)	35
Wheeler Ridge (All Pools)	20
Bardsdale (All Pools excepting Elkins (Area)	25
Capitan (Sespe)	25
Edna, San Luis Obispo	35
Ex-Mission, Santa Paula	35
Modelo, Piru	35
Newhall (Newhall)	35
Santa Barbara (Vaqueros)	25
Sargent, Santa Clara	35
Sespe Canyon	20
Shiells Canyon (All Pools)	20
Simi-Conejo-Oxnard (Simi)	35
Sisar-Silverthread, Santa Paula	35
Summerland (All Pools)	20
Tapo-Eureka, Piru	35
Timber Canyon, Santa Paula	35
Torrey Canyon, Piru	35
Wiley-Towsley Canyon, Newhall	35
Los Angeles	35
Puente Hills	35
Torrance Area (Flint)	25
Whittier (Central Area)	25
Whittier (Rideout-Heights Area)	20

☆

HENRY C. ENGLAND, production superintendent for Sun Oil Company at Longview, has been transferred to Tyler, where he will have charge of production in the East Texas district, exclusive of the big field, and North Louisiana.

Lend-Lease Oil Reveals Stepped-Up Tempo of War

Lend-lease exports of petroleum and products during the four months ending with June reached a total value of $266,399,000, President Roosevelt disclosed August 23 in his 16th quarterly report to Congress on lend-lease operations.

Evidence of the increasing tempo of the war, shipments during the four-month period were more than a third of all the petroleum shipped to the Allied Nations from March 11, 1941, to February 29, 1944.

The President reported that from March, 1941, through June, 1944, $1,009,399,000 of petroleum products were sent to our allies under lend-lease, but pointed out that this "was less than nine percent of our total production of petroleum products, and much of the gasoline and oil we have sent abroad under lend-lease has been used by our own overseas air and naval forces."

The ultimate measurement of the aid we have given through lend-lease and received through reverse lend-lease is not to be found in the dollar figures but in terms of the battles won, the millions of enemy troops killed and captured and the hundreds of thousands of lives saved, Mr. Roosevelt contended.

Taking as an example a lend-lease bomb turned over to the United Kingdom and dropped by a British plane on a German gun emplacement holding up the progress of American tanks in France, he told Congress:

"We made that bomb for use against our enemies. The British used it against our enemies. Because the bomb was dropped by a British plane its cost was charged up to lend-lease. If the bomb had been dropped by an American plane its cost would be included in the U. S. Army Air Forces' own procurement costs. In either case the ultimate destination of the bomb and the benefits of its use to the United States and to the other United Nations are the same."

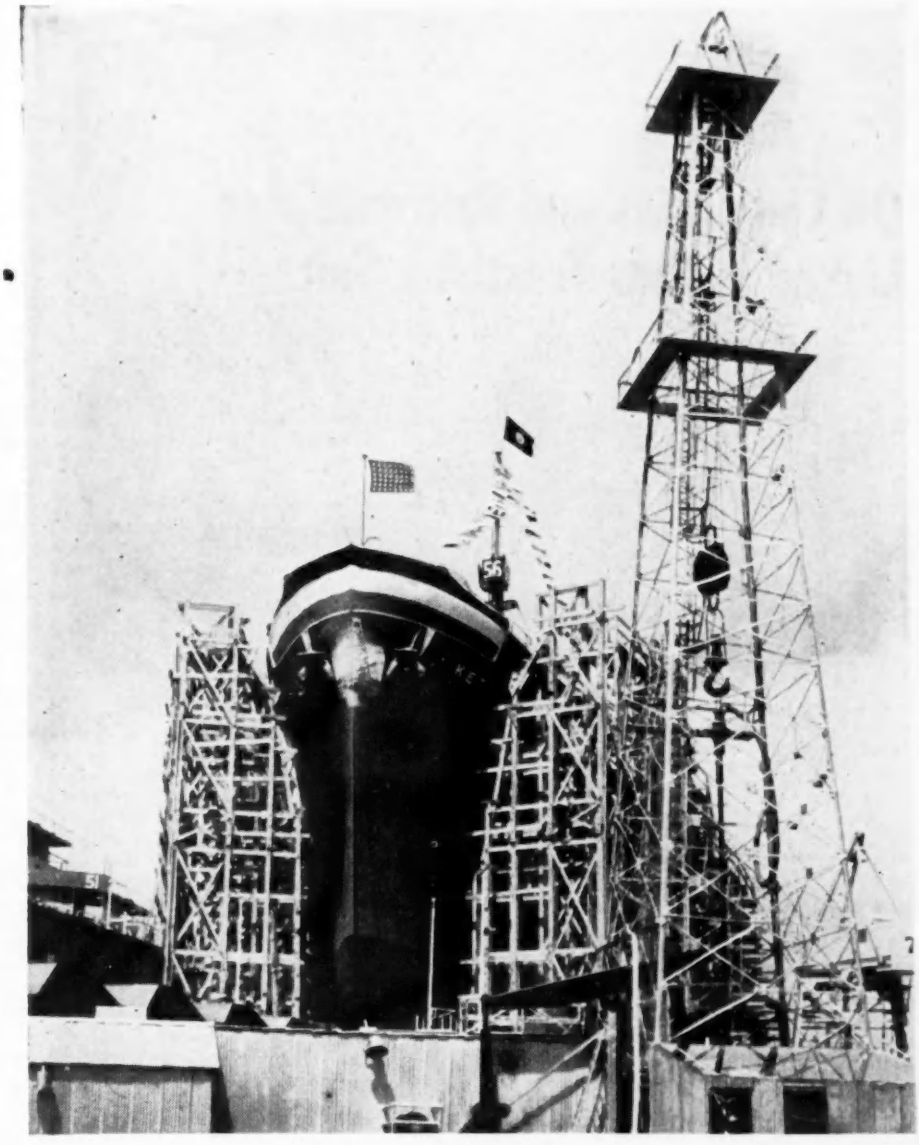
Among the petroleum-consuming equipment lend-leased to our allies since March, 1941, were 30,900 planes, 26,900 tanks and 637,600 other military vehicles, 511 cargo ships of 1000 gross tons or over, 1284 merchant and auxiliary craft of under 1000 gross tons, and more than 1400 naval vessels of all types. In addition, the allies have purchased 7000 planes, 1600 tanks and 270,000 trucks for cash, the report showed.

Authorization Issued for Making 633 Tank Trucks

Authorizations for the production of 633 petroleum tank trucks were issued by the War Production Board between January 1 and August 18, it was announced August 23. Three hundred of the trucks will be manufactured by the Freuhauf Trailer Company, Los Angeles; 144 by the Heil Company, Milwaukee; 50 by the Pennsylvania Furnace and Iron Company, Warren, Pennsylvania, 41 by the Quaker City Iron Works, Philadelphia, and the remainder by 14 other concerns.

Authorizations also provide for the building of 15,487 general freight trucks, 117 low-bed heavy haulers and 130 miscellaneous trucks.

Oil and Shipbuilding Combined



Two American industries that have prominent roles in the defeat of the Axis are shown in the montage picture above in which an ingenious photographer has managed to strike oil in the heart of one of the country's major tanker shipyards. The ship ready for launching on the ways is the S. S. Kettleman Hills, 16,500 ton tanker built by Marinship Corporation, Sausalito, California, for the United States Maritime Commission. The Kettleman Hills, first of a fleet of 8250 horsepower "Hills" class tank ships named after important oil producing areas, honors Kettleman North Dome, Located in California's Kern County.

Civilian Oil Supply to be Eased by Europe but De-Control to Come Later

Collapse of Germany in the near future would ease the strain on East Coast supply and might permit some increase in gasoline rations, but whether such an increase would be possible and the amount thereof would depend upon the Office of Defense Transportation rather than PAW and OPA.

PAW officials believe that the end of the European war and the diversion to East Coast service of some of the tankers from our steadily growing fleet which then would be possible might result in an increase of 200,000 to 300,000 barrels in supplies available for civilian distribution.

The ODT, however, concerned with the rail situation and the necessity of stepping up supplies to the West Coast, is seen as interposing objections to the use of tank cars to increase civilian supply, although it is admitted in some quarters that once the public learns that an increase is possible a demand may arise which will be difficult to turn down.

Once fighting in Europe stops, it is not believed that supplies for the resumption of peacetime activities will offer any great problem, but there is a sharp difference of opinion over the volume of products which will be required for an

all-out Pacific war, with ships and planes operating over great distances.

Currently, rail shipments from Texas to the West Coast have been stepped up to a relatively high figure, and PAW has issued orders banning the eastward movement of residual oil eastward from the West Coast states with a view to drawing on supplies in Montana and Wyoming.

While victory over Germany will ease the situation at home with respect to many civilian commodities and will permit a rather rapid relaxation of the restrictions on the production of oil country and other equipment, it is not likely that PAW will make any moves to de-control civilian oil supplies until the Pacific situation has been fully evaluated and definite estimates developed on the requirements for that war and for European rehabilitation.

Oil Companies and Railroads Are Linked in Anti-Trust Act Suit

Charging, among other things, that the defendants, by conspiring with the major oil companies owning and operating common carrier pipe lines, have fixed arbitrary and non-competitive rates for the transportation by rail and pipe line of petroleum and products, thus denying to the West the advantage of low-cost shipment by pipe line, the Department of Justice, on August 23, filed a complaint in the federal district court at Lincoln, Nebraska, charging violation of the Sherman anti-trust act by 47 railroads, two railroad associations, two financial houses and 31 individuals other than officers and members of the 51 organizations.

Specifically, the government alleges that the pipe-line companies established their rates at the level of the rail rates and required minimum tenders greatly in excess of tank car capacities, thus protecting the high long-haul rail rates, and in return the railroads reduced the rates on the short-haul rail movements from the refineries and terminals of the oil companies.

Announcing the filing of the complaint, Attorney General Francis Biddle explained that it alleges that a combination "of private financial, industrial and railroad interests have acted collusively to maintain non-competitive rates for transportation and to prevent and retard improvements in the services and facilities of railroads for the western part of the United States. It also charges that the defendants have retarded and suppressed the development and growth of the motor carriers and other forms of transportation competitive with the railroads in the western area."

Oil Company Mentioned

While a number of oil companies are alleged to have participated in the agreement on oil rates, only Standard Oil Company (Indiana) is specifically named in the complaint, which charges that:

"The defendants, in carrying out the aforesaid offenses, and as a means of effectuating the same, entered into an agreement with those major oil companies which own and operate common carrier pipe lines for the transportation of petroleum products, that the said pipe line owners maintain pipe line rates at the same level as the rail rates from the same points of origin to the same points of destination, thus protecting the high long-haul rail rates which have been and are maintained by the defendant railroads for the movement of petroleum products from refining centers in Oklahoma and Texas to consuming centers in the western part of the United States; that the said pipe line owners require shippers over the pipe lines to tender for movement quantities of petroleum products greatly in excess of tank car capacities for rail movements; and that the defendant railroads reduce rates on short-haul rail movements from the refineries, pipe line terminals and water terminals of said major oil companies. As part of the said agreement and arrangement, the oil companies, notably the Standard Oil Company (Indiana) have agreed to support and have supported the defendant railroads in applications for increases of long-haul rail rates.

Collusion Charged

"By agreement with the defendants proportional pipe-line rates, published or caused to be published by said pipe line companies from their various receiving stations to their several terminals on traffic which is shipped beyond their terminals by rail, are so constructed that the addition thereto of the local rail rates from the pipeline terminals to the ultimate destinations equals the through rail rates from the points of origin to such destinations. The said pipe-line owners by agreement published or caused to be published joint pipe-line rates constructed on the same rail equalization basis as the individual rates of the pipe-line companies and also the proportional rates to the various terminals on each other's lines. The said pipeline owners and defendant railroads have not established any joint through rail-and-pipeline rates. The public served by said common carrier pipe lines was and is deprived of the inherent benefits of such low-cost transportation."

Oil Men Are Promoted By Quartermaster Corps

Don D. Montgomery, former consulting petroleum geologist in Oklahoma and Arkansas, has been promoted to captain in the Quartermaster Corps. Since October, 1943, he has been in the office of the Quartermaster General in Washington as assistant chief of the administrative branch of the fuels and lubricants division.

Advancement of Captain Hubert P. Barton to major in the Quartermaster Corps also was announced. He was president of the General-Penn Refining Company, of Baltimore, when he entered the Army in November, 1942, and now is chief of the products and materials section, planning branch, fuels and lubricants division.

U. S. Tax Collections on Gasoline Show Increase

Federal tax collections on gasoline and lubricating oils increased between June and July but receipts from pipe line transportation fell off, it was announced August 24 by the Internal Revenue Bureau.

July revenue from gasoline was $22,213,653, the bureau reported, against $21,028,517 in June and $26,365,208 in July, 1943. For the first seven months of the year, receipts aggregated $147,806,513 against $146,044,839 for the corresponding period last year.

Lubricating oils paid $5,473,271 in taxes against $3,808,507 in June and $4,294,413 in July of last year, with a seven-month total of $32,388,398 against $26,338,707.

Only $1,120,079 came in July from pipe line transportation, against $1,621,370 in June and $1,202,502 in July, 1943, but the total revenue for seven months was $9,161,973 against $7,657,719.

June Crude Output Down But Daily Average Gains

Crude oil production for June was officially placed by the Bureau of Mines at 137,234,000 barrels, a drop of 4,000,000 barrels from the May output of 141,293,000 barrels, but the daily average output reached a new record of 4,574,000 barrels against 4,558,000 barrels in the preceding month.

The demand for domestic crude, 4,756,400 barrels, exceeded production by 182,400 barrels daily and necessitated withdrawals from domestic crude stocks at the rate of 181,900 barrels per day.

The bureau reported the price index for petroleum and products remained steady at 64, compared with 62.6 for June, 1943, while on the basis of the crude oil capacity represented by the refinery data, the operating ratio was 95 percent compared with 85 percent last year.

Kansas Water-Flooding Operations Described

Water-flooding operations in Kansas are described by the Bureau of Mines in a "Report of Investigations 3761," by Peter Grandone, petroleum engineer at Bartlesville, Oklahoma.

Since 1936, the report disclosed, more than 4,000,000 barrels of oil have been recovered as the result of the injection of about 41,000,000 barrels of water, a ratio of one barrel of oil to 9.66 barrels of water.

Water-flooding in Kansas began on a planned basis in 1935 with the passage of a state law authorizing that method of oil recovery, and a total of 52 projects had been undertaken on 2612 acres up to November, 1942. It was at that date that the recovery passed 4,000,000 barrels, Grandone reported.

Significantly, the report said, "although a small part of the oil recovered by water-flooding would have been recovered by primary methods, most of the water-flooding operations in Kansas were begun when the properties had almost reached their economic limit of primary production."

Water-flooding operations have been confined to the stripper fields in the southeastern part of the state.

House Passes Surplus Property Bill Senate Considering Its Own Version

A full week of debate on the disposition of an estimated $75,000,000,000 of surplus war property culminated August 22 in passage by the House of a bill setting up a surplus war property administrator. The Senate the following day, began debate on another measure putting the responsibility of disposing of surpluses on an eight-member board representing the geographic areas and economic interests of the country.

Under the Senate bill, disposal of all surplus lands would be vested in the Interior Department which, Secretary Ickes told the Senate military affairs committee a week earlier, would give consideration to the oil and mineral deposits in disposing of the lands.

The Secretary of the Interior also would be a member of a 17-man advisory board made up of cabinet members and chairmen of various wartime agencies to assist the administrator proposed in the House bill.

Features of the House bill were a provision making the sale of properties costing more than $1,000,000 contingent upon the approval of the advisory board, and a prohibition against the disposition of any synthetic-rubber plant or oil pipe line costing the government $5,000,000 or more except under an option previously granted or by lease for a term of not more than five years or under a program submitted by the administrator, on which Congress would be given six months to act.

Pipe Lines Included

Decision to include pipe lines in the category of facilities to be disposed of under Congressional guidance was forced through by Representative Francis E. Walter of Pennsylvania, who expressed the belief that Standard Oil Company (New Jersey) was the principal potential buyer of the Big Inch and Little Big Inch lines, and intended to use them for natural gas distribution.

Walter obtained support of other members of the House when he predicted that if the lines were converted to natural gas distribution, the Pennsylvania anthracite industry would have to go on government relief.

The measure before the Senate goes further than the House bill by providing that no synthetic rubber plants and facilities, aviation gasoline plants and facilities, or pipe lines may be disposed of until 30 days after the submission to Congress of proposed plans for disposition.

"These provisions strike a happy balance between a freeze on the disposition of such property which would hamstring the disposal agency, and a sweeping grant of authority to the board to dispose of major national assets," the military affairs committee explained.

The legislation also attempts to set up adequate safeguards against "monopolistic aggrandizement," requiring the board, in beginning negotiations for the disposal of any plants or other property costing $1,000,000 or more, to seek advice of the Attorney General, who would rule whether the proposed disposition would either violate the anti-trust laws or encourage monopoly or undue concentration of industry or commerce or restrain competition substantially.

"Both in the interest of promoting production and employment and further discouraging monopolistic practice," the report declared, "your committee has required continued operation of plants disposed of to private industry. This operating clause is obviously important to the promotion of production and employment. It also has an indirect bearing upon the monopoly question, for monopoly or undue concentration of industry may sometimes be effected, not in the operation, but in the closing of a plant that otherwise might provide competition in a given field of industry."

Options Outstanding

In the exercise of options given for the acquisition of plants, the bill calls for review of each option by the Attorney General to determine its validity, and options are not to be honored where they are against public policy. Virtually all of the government-owned plants carry an outstanding option to purchase in favor of the contractor operating the plant, the committee found; while standard options have been used in the great majority of cases, hundreds of varieties have been employed and, testifying before the committee last April, Attorney General Francis Biddle questioned the validity of some of the options as against public policy, citing one option that would prohibit the use of a plant for commercial purpose for a period of 20 years.

With respect to the disposition of surplus land, the Senate bill adopted proposals of Senator Joseph C. O'Mahoney of Wyoming, calling for maintenance by the general land office of an all-inclusive inventory of all lands owned by the United States, with the disposition of all land classified as agricultural to be vested in the Department of Agriculture under the provisions of the Bankhead-Jones farm tenant act, and land suitable for disposition under the statutes administered by the Department of the Interior to be disposed of by that department.

This provision would take out of the control of the Reconstruction Finance Corporation the handling of oil-bearing lands, such as the Moore air field which it plans to offer for sale next month.

Moore Field Matter

During debate on the legislation August 24, the Senate adopted an amendment proposed by Senator Elmer Thomas of Oklahoma, providing for sale of the Moore airfield in Oklahoma to the original owners for the original purchase price plus the amount expended by the navy, or approximately $150,000, as originally proposed by the late Secretary of Navy Frank Knox.

Thomas read a letter from W. L. Clayton, surplus war property administrator, disclosing that the sale of the field, by the Reconstruction Finance Corporation for next month was temporarily suspended to give congress another chance to pass on the matter.

The Senator explained that the land has a "speculative value" by reason of the discovery of oil in the vicinity but said there was considerable doubt as to the value of the airfield.

Drilling to a point between 7000 and 8000 feet, 200 feet south of the land, failed to show any oil, he said, and of five other wells drilled only three produced oil. Two wells are now drill-

Crude Oil Production Below Recent Peak

In averaging 4,676,585 barrels daily in the week ended August 26, United States production of crude oil was 13,600 a day lower than the all-time record of the previous week, tabulation of The Oil Weekly indicated.

Some difficulty in maintaining production at the high levels now desired was reflected in the new figures, which showed decreases of 1500 to 6400 barrels in daily output in Illinois, Kansas, Michigan, Montana, New York, and Wyoming. In the aggregate, those states produced about 20,000 barrels a day less than in the week of August 19.

Partly offsetting those declines were increases of 8000 barrels in California, which stepped production up to 867,000 daily, and 2000 in Oklahoma which averaged 342,000 daily. Texas was unchanged at 2,108,900 per day.

While the nation already is producing at rates causing damage to some fields, further expansion of crude output is scheduled for September, under government allocations calling for still heavier drawing on fields of Texas and Oklahoma.

Crude Oil Production in the United States

(Estimates compiled by The OIL WEEKLY. All figures indicate daily averages, in barrels.)

STATE OR DISTRICT	PRODUCTION IN WEEK ENDED August 26	August 19
Alabama	200	200
Arkansas	80,700	81,000
California	867,000	859,000
Colorado	8,500	8,150
Florida	50	50
Illinois	205,400	208,600
Indiana	12,900	13,000
Kansas	278,900	285,300
Kentucky	24,600	25,400
Louisiana	362,000	362,000
North	73,000	73,000
South	289,000	289,000
Michigan	49,800	52,000
Mississippi	45,900	45,750
Missouri	100	100
Montana	22,800	24,700
Nebraska	600	700
New Mexico	108,600	108,600
New York	13,100	14,600
Ohio	8,000	8,000
Oklahoma	342,000	340,000
Pennsylvania	40,500	40,500
Tennessee	35	35
Texas	2,108,900	2,108,900
Upper Gulf Coast	535,200	535,200
East Texas Field	371,800	371,800
Rest of Eastern Texas	147,700	147,700
Lower Gulf Coast	224,900	224,900
Southwest Texas	77,400	77,400
South Central Texas	19,300	19,300
West Texas	484,900	484,900
North Texas	148,800	148,800
Panhandle	98,700	98,700
West Virginia	8,400	8,700
Wyoming	87,600	91,700
Total United States	4,676,585	*4,690,185

* All-time peak.

ing which, if dry, would show that the airfield has little or no value as oil land.

"The reason for this amendment is to have this question settled at a time when the former owners of the land can realize something from the land," Thomas said. "If this matter could be settled before the wells are completely drilled, the former owner could be assured of getting something out of the land, which they would have done if the navy had not stepped in and condemned the land originally."

New Association Executive Named in California

Don E. Gilman, former vice president and western executive of the Blue Network Company, will become executive vice president of the California Oil and Gas Association, effective September 1 and D. S. Kilgour has been promoted from assistant secretary to secretary of the association.

Big Inch Pushes as Deliveries To East Set New All-Time Record

Pushing the Big Inch pipe line for all it is worth, PAW last week issued its schedules for the next three months, calling for the movement of 320,000 barrels of oil daily during September, October and November.

The schedule calls for the movement of 126,200 barrels daily of East Texas oil, 66,800 barrels from Southwest Texas and 127,000 barrels from West Texas.

Pipeline movement of oil to District 1 reached an all-time high during the week ended August 5 with an average of 715,222 barrels daily, PAW announced. This movement, which consisted of 438,286 barrels of crude and 276,936 barrels of refined products, was 6147 barrels above the previous record of 709,075 barrels daily, set for the week ended July 15.

During the week ended August 5, the Texas Pipe Line Company's 34-mile six-inch products line from Lockport, Illinois, to East Chicago, Indiana, started operations at the rate of 18,500 barrels daily, with the first delivery of gasoline reaching the eastern terminus August 4.

Three days later construction of the Pan American Pipe Line Company 36-mile eight-inch crude line from the Willamar oil field to Port Isabel, Texas, was completed and operation is scheduled to start as soon as tests have been made. The Yale Oil Pipelines project for 80 miles of six and eight-inch crude pipelines connecting the Elk Basin, Wyoming, field with refineries at Laurel and Billings, Montana, is nearing completion and will probably begin operating before the end of the month.

As of August 1, PAW reported, total pipe line construction completed amounted to 7901 miles—4274 miles for crude and 3627 miles for products—including 4980 miles of new pipe and 2921 miles of second-hand pipe, out of a total construction program of 8535 miles, including 5597 miles of new and 2938 miles of second-hand pipe, to cost $259,500, of which the Government will have furnished $167,000,000 and private industry $92,500,000.

In addition, the direction of flow of 3366 miles of existing lines was reversed, with 44 miles still to be completed, and 436 miles of natural gas line has been converted to oil service.

The mileage of all pipe line construction, reversals and conversions programmed as of August 1 totaled 12,381, of which 11,703 miles have been completed.

President Declares Anglo-American Oil Pact Must Have Ratification by Senate

Cutting short an apparent difference of opinion in the Senate Foreign Relations Committee on the point whether the Anglo-American oil agreement required ratifications, Roosevelt on August 24 formally submitted the pact as a treaty requiring Senate approval.

His action was disclosed in a message to the Senate, received after the Foreign Relations Committee, which acts on treaties, and the special petroleum committee held a joint session, and subsequently met separately. Only a few hours before the President sent the agreement to the capitol, Chairman Tom Connally of the Foreign Relations Committee declined to say whether it had decided that ratification was required.

The agreement was made public by the State Department August 8, when officials said it had not been determined whether it was an executive arrangement or a treaty. The matter was taken under consideration by Connally's committee, which on August 18 received a critical protest against the pact from J. Howard Pew, president of the Sun Oil Company.

The President's decision to submit the agreement for Senate ratification bore an importance beyond that attending the impact of the arrangement on the American oil industry, since this is the first of several international compacts on postwar matters which are in course of negotiation, and a precedent was set which, if followed, will mean that the Senate will have a strong voice in the field of international affairs.

Obtaining of Oil Industry Housing Clarified by WPB

Procedure to be followed by oil operators and certain of their employes in obtaining priorities assistance for materials to be used in the repair and construction of petroleum industry housing was clarified and revised by the War Production Board August 25 in an amendment to direction 1 to preferential rating order P-98-B.

The revision was adopted on the recommendation of PAW, which explained the amendment permits the use of the regular order P-98-B maintenance and repair procedure for the upkeep of houses owned by operators in all branches of the industry and occupied by their employes. It also extends a similar privilege for a special material priority to housing owned and occupied by employes of petroleum operators if the housing is on or adjacent to an oil or gas lease.

For the construction of housing on or adjacent to a lease, an operator will use the regular production rating on P-98-B. An employe of an operator must apply for authority to construct housing from the PAW district office for the district in which it is to be erected.

Operators engaged in pipe line operations must obtain approval to use materials for housing by filing PAW form 30 with the appropriate PAW district office.

Production housing in urban areas will be handled jointly by PAW and the National Housing Agency, as will housing construction by operators engaged in refining or marketing. For these types of housing, operators will file form WPB-2896 with the appropriate PAW district office.

Texas Company to Drill Test at Stratton, Nebraska

In an attempt to prove up a large block of leases assembled in Hitchcock County, Nebraska, The Texas Company staked Taunton 1, NW NE NW of 22-2s-35w, 1½ miles southwest of Stratton, and plans to carry the well to 5000 feet or to the Arbuckle lime. Helmerich & Payne, Inc., of Tulsa, has the contract and is moving in machinery. There have been a number of stratigraphic tests drilled in the area during the past year but this will be the first big hole test. The Denver office of The Texas Company will have charge of the operation.

PAW Studies Statistics On West Edmond Pipe Line

Additional statistics to determine ultimate pipe line needs for the new West Edmond pool of Central Oklahoma will be assembled by District 2 of the Petroleum Administration for War before it recommends allocation of material and pipe for another pipe line outlet out of the pool, it was decided at a meeting of pipe line companies in Chicago. Their applications to lay additional crude outlets from the new pool were rejected some weeks ago. Field statistics probably will be gathered by members of the PAW staff at Tulsa.

Meanwhile, West Edmond is producing in excess of 20,000 barrels of oil daily from approximately 110 wells. Only oil outlet is Cimarron Valley Oil Pipe Line Company's 8-inch line which carries the oil to the Champlin refinery at Enid and to Oklahoma City. Its capacity is 40,000 barrels daily.

PAW officials admitted that additional pipe line facilities will be needed shortly in West Edmond and the agency must select the carrier or carriers from the 8 companies which have applied for permission and materials allocations to lay lines in the field. Operators predict the pool will attain a daily production of at least 60,000 barrels daily by the end of the year.

Power Unit Life Extended By Reconditioning Valves

Conservation of heavy hauling equipment engines, very important now, aided by hard-facing program for valves

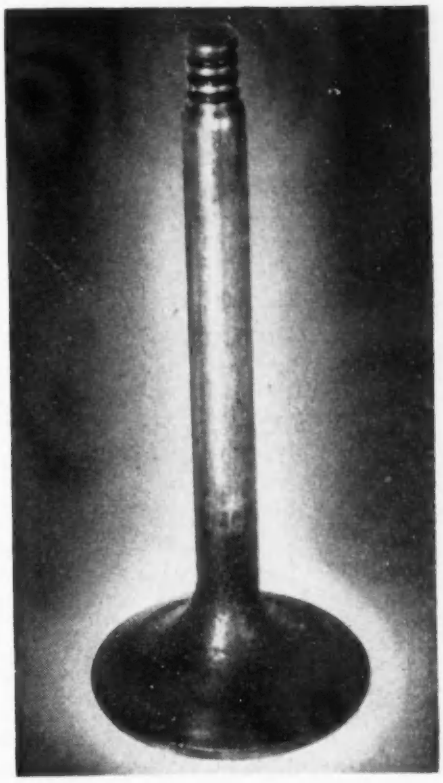
By ELTON STERRETT, Staff Writer

NO CHAIN, as the old saying goes, is stronger than its weakest link, and no heavy duty oil-field truck is more rugged than the first vital part that fails to function. Especially is this true of the relatively small parts which form so much of the functional mechanism of the power plant. Operating over longer periods than ever before, and driven in many instances by men lacking the experience of prewar drivers, the engines are meeting service conditions as severe and even more sustained than those of the power plants in war vehicles.

Overhaul of power plants, formerly carried out on a regular schedule of so many miles or so many months in operation now can come only when some functional failure of the power plant demands it. Demands on the time of trained mechanics who are still available are such that preventative overhaul, as distinct from repair servicing, is no longer possible.

One of the parts of the power plant directly affected by long hours and continuous overload operation is the valves. Designed and formed from the best steels available for the purpose, the constant scouring of hot gases, combined with pounding of valve on seat which rapidly becomes worse as slack introduced by wear increases, soon renders the seal between valve and seat so ineffective that the engine is no longer able to deliver its rated—and badly needed—horsepower. When such a condition is known to exist in an engine, replacement of the valves is imperative if the units are not to become warped, with consequent sticking in the guides and possibility of a ruined motor.

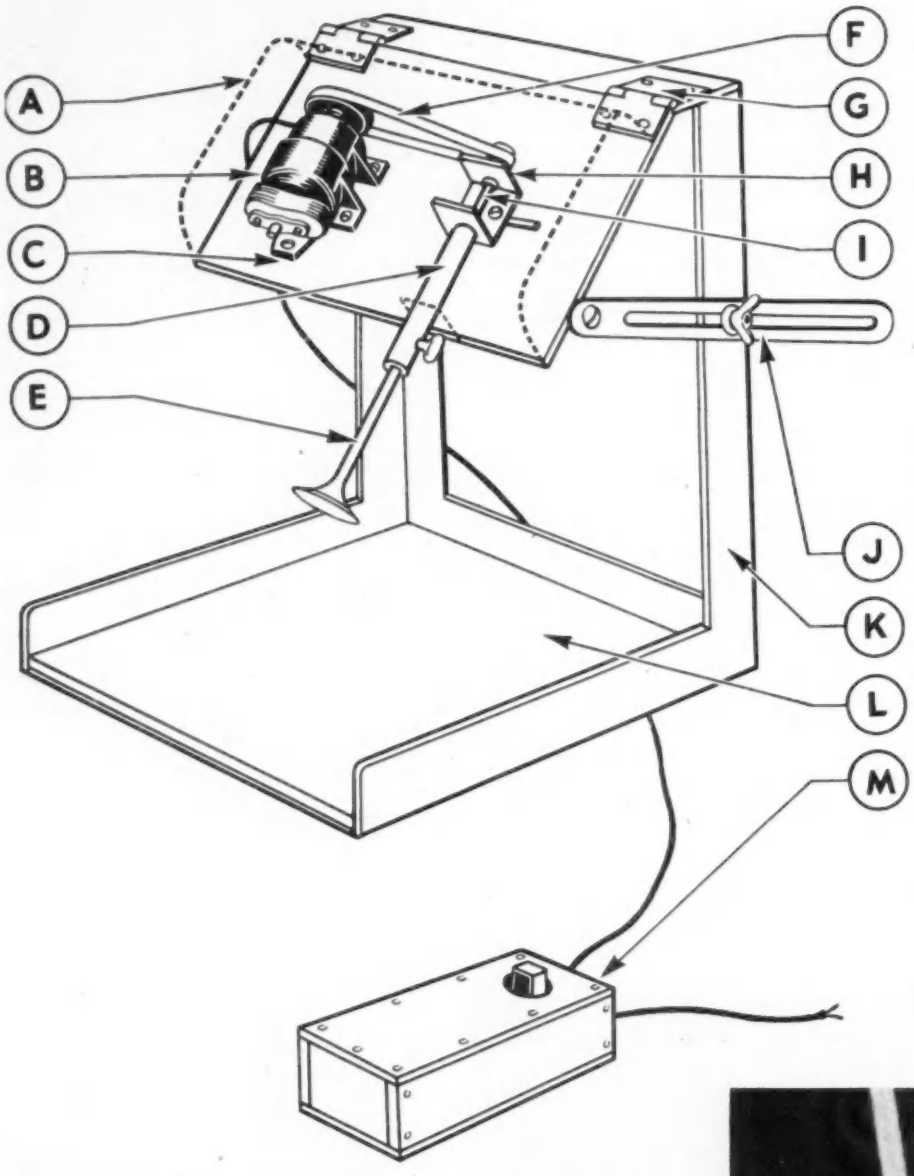
Replacement valves for truck engines can be obtained only against the competition for such parts from airplane, tank and other mechanized war vehicles, and the amount of suitable steel available is rigidly restricted. Such conditions need not delay nor prevent the servicing of the power unit, if the valves are removed before warping or burning has progressed to the point where there is not sufficient of the original metal left to provide a backing for hard-facing metal. Records of one oil company's transportation division show that 82.5 percent of the valves removed can be salvaged under the refacing schedule, thus leaving only 17.5 percent of the quota of replacement valves to come from stock.



This truck engine valve, "miking" close to tolerance on the stem, is so eroded and corroded by burned gases as to be no longer usable. Further use would quickly result in scored seat, warped stem, and so serious a falling off in power as to reduce truck loadings. All illustrations courtesy Stoody Company.

Chucked in a small lathe, with center to support head and prevent stem distortion during operation, this valve is being turned down by removal of scale and worn section, a round-nosed tool being used to give concave area in which metal is to be added. Note control shoulder at outer edge of valve bevel. This should be carefully preserved.

The valves which, after being checked for straightness and minimum wear of stem, deemed capable of carrying the hand-facing metal, are first carefully centered in a lathe—assuming there is no automatic chuck available to do this task mechanically—and the working face or bevel turned down to remove the oxides formed as a result of heat and the corrosive action of gases formed by fuel combustion. Best practice indicates that a round pointed lathe tool should be used for this operation, care being taken to remove all the oxidized surface over an arc covering the normal area of seat contact. The turning should not remove the outer edge of the valve, it being found advantageous to leave a shoulder or back-up flange against which the hard-facing metal is deposited. In turning this recess for the metal to be deposited, it is not necessary, or even advisable, to strive for a smooth finish; the principal result desired being obtaining clearance sufficient to insure a body of the



JIG FOR HARD-FACING EXHAUST VALVES
A—Cover 12 x 14 x 18 inches galvanized sheet metal. B—Motor, 1 RPM back-geared. C—Swinging table, 1-8 x 9 x 12 inches. D—Valve clamp, machined to fit shaft on one end and valve stem on other (size varies with valve). E—Valve shown in position. F—Belt and pulleys (size vary according to desired welding speed). G—Hinges, standard hardware. H—Shaft bracket, 1-8 x 1½ x 5 inches. I—Shaft ¼ (diameter) x 4 inches drill rod. J—Adjusting arm, 1-8 x 1 x 12 inches. Two required. K—Frame ⅛ x 1 inch angle; 11-inch, two required; 12-inch three required. 1-8-inch strap; 2 x 12 inches, one required, 1 x 12 inches, one required. L—Asbestos plate, 12 inches square. M—Foot switch. (Any single-pole switch which is "on" when depressed and "off" when released.)

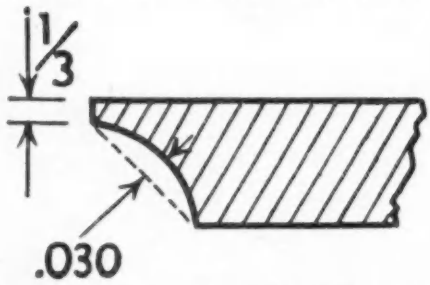
hard-facing metal at the contact area after refacing to size.

If the supporting shoulder be made too thin, or be entirely turned off, as sometimes might be done if the edge appears badly oxidized or scaled, the hard-facing metal lacks backing at the edge, and the tendency is for the torch to melt away the relatively sharp edge of the valve, and thus to change not only the contour angle of the face, but also to reduce the overall diameter to the point where the refaced valve will no longer true up to specifications.

While an experienced welder may be able to rotate a valve manually and apply a relatively uniform layer of hard facing metal under the shoulder of the turned-down valve, use of a motor-actuated rotating device leaves the welder free to concentrate on the deposition of metal only, and thus to prevent possible damage to the parent metal with the flame while momentarily busied with valve rotation.

Such a rotating device, in which standard and uniform rotation of the blank is obtained, makes it easier for the welding operator to deposit a uniform layer of metal, and at the same time guards against porosity which, becoming evident only when the valve is being refaced for reuse, causes rejection of the unit. The fractional horsepower motor required to drive the unit should preferably be of the super or worm-gear reduction type, with spindle speeds of 1 to 6 revolutions per minute. By varying driver and driven pulley diameters experimentally, the best speed for metal deposition can be ascertained, and the motor clamped to the base at a point where the desired ratio will use a standard or stock A section V-belt or an endless round belt. The belt used must not be mechanically fastened, as the slight jar imparted to the valve by the coupling contacting either pulley tends to cause metal segregation, followed by porosity.

Use of a foot-switch, rather than a button mounted on the rotating stand, permits the welder to control closely the rate of rotation of the stem, or to



When turning worn valve for hard-facing, the proportions indicated in this sketch have been found to give best results both in applying metal and in extended valve service.

Below—Close-up of torch tip, hard-facing rod and valve with partially deposited replacement of seat area. The applied metal is built up, in this illustration, to give the best results in application and cooling, with the backup shoulder being used as gauge and retainer. Synchronized rotation of valve enables all welding to be done at same spot in jig, metal deposition being regulated to progress of groove below torch.

AQUAGEL CEMENT*

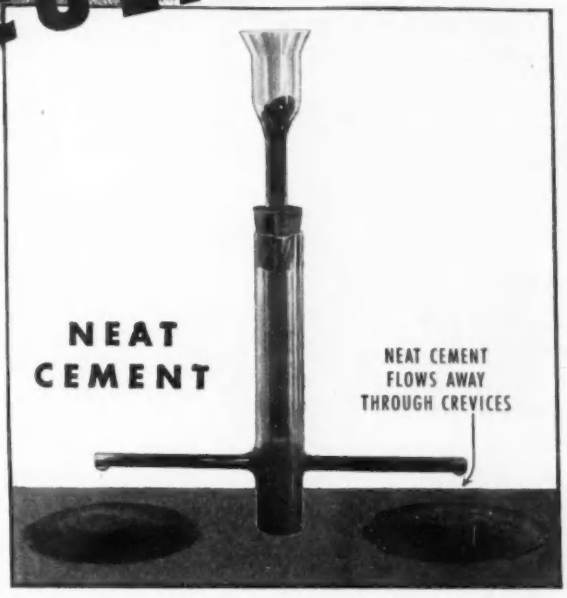
FOR LOST CIRCULATION

Saves time and cement for operators — Severe circulation losses frequently respond only to a cement job.

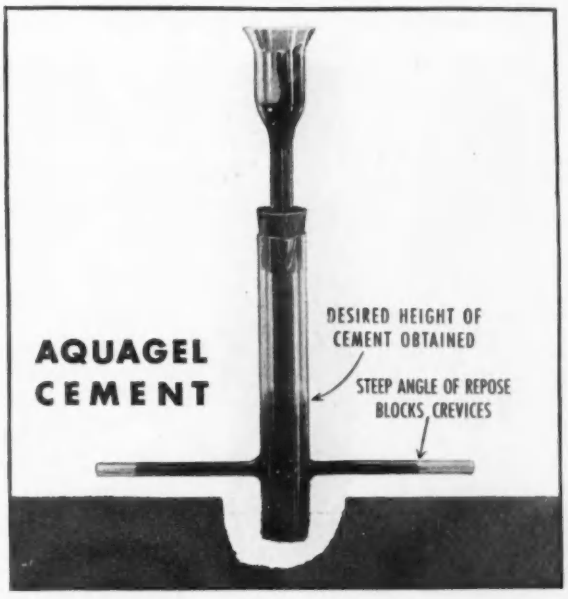
AQUAGEL Cement seals off fractured and cavernous zones more effectively and with less material than neat cement due to its high angle of repose and gelling properties.

AQUAGEL Cement tends to pile up and bridge the entrance to caverns, while neat cement seeks its own level and flows away like water. See examples at right.

AQUAGEL Cement has many other advantages which make it unequaled for solving lost circulation problems and for cementing casing, but its properties of high angle of repose and gelation save operators many hours of time and large quantities of cement slurry when sub-surface crevices are encountered.



The apparatus above represents a well drilled into a badly fractured or creviced zone (glass-tubing cross arms represent crevices), the funnel tubing being the "casing." Neat cement on being poured down the funnel tube fills the bottom of the glass "hole" and flows out of the tubing. It continues to flow out of the tubing while slurry is added to the funnel. Note flat angle of repose. This demonstrates why large crevices are difficult or impossible to seal with neat cement.



The same apparatus as used for neat cement shows the results of pouring AQUAGEL Cement slurry into the funnel tube. The slurry piles up, seals the cross arms and allows the slurry to reach a desirable height in the hole. Note the steep angle of repose inside the tubing. This shows the plug-like flow of AQUAGEL Cement.

PATENT LICENSES, unrestricted as to sources of supply of materials, but on royalty bases, will be granted to responsible oil companies and operators to practice inventions of any and/or all of United States Patents Numbers 1,807,082; 1,991,637; 2,041,086; 2,044,758; 2,064,936; 2,094,316; 2,119,829; 2,214,366; 2,294,877; 2,304,256 and further improvements thereof. Applications for Licenses should be made to Los Angeles office.

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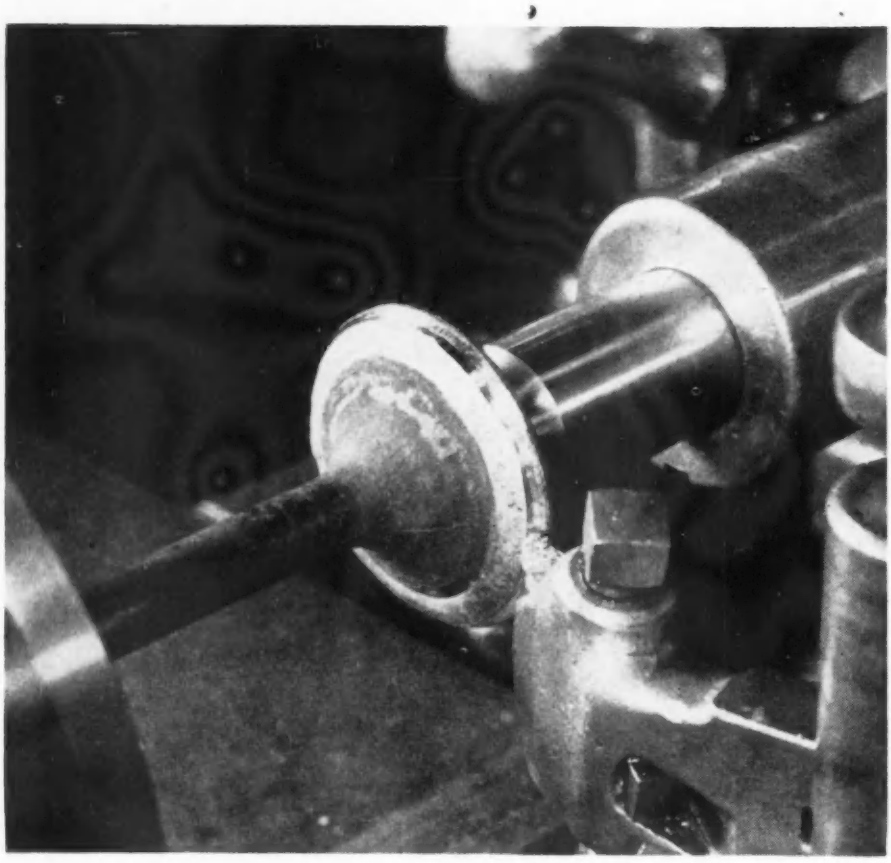
** AQUAGEL Cement is made by the addition of a small amount of AQUAGEL to any construction, oil-well, or special cement.*



Left—Using a diamond-pointed, carbide-faced tool, the excess metal deposited by the torch is being removed to give a bevel closely approximating the desired finish contour. The granular structure of the chips of hard-facing material illustrates the extreme hardness of this material, and indicates the need for a very fine feed when resurfacing.

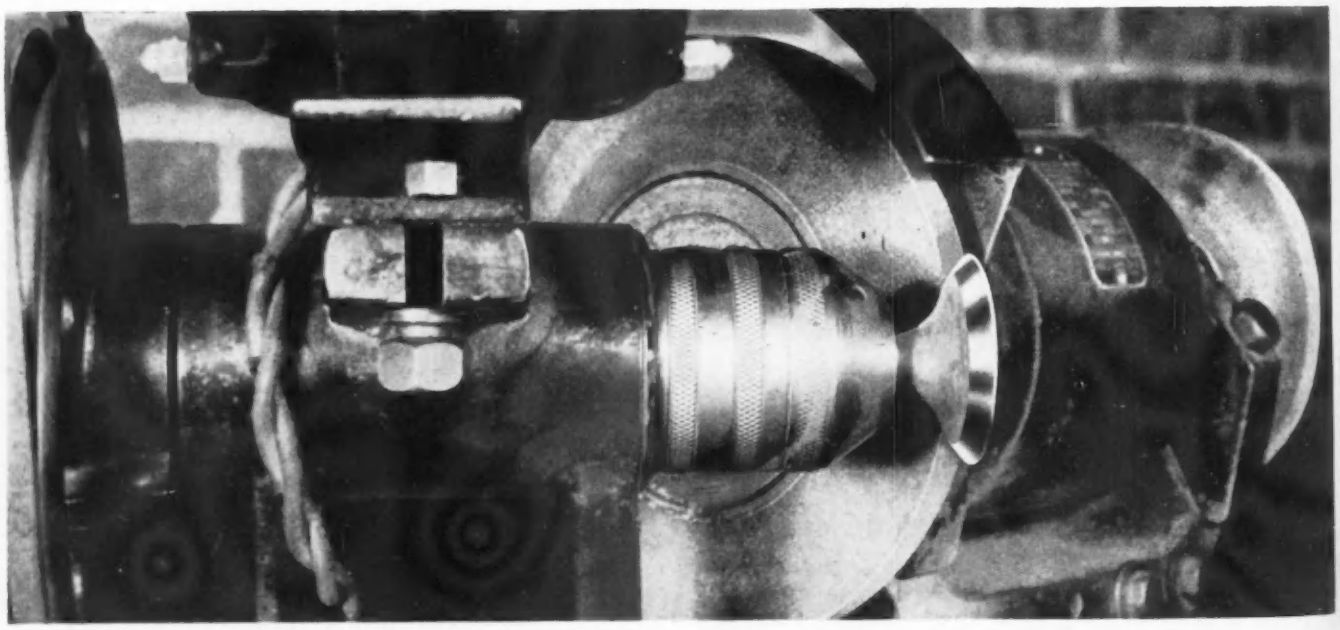
stop the unit momentarily while clearing up an area of imperfect application.

Operators who have adopted the hard-facing plan find that a 5/32-inch rod seems to give most uniform surfacing. The torch tip used should be about one size larger than would be used in applying mild steel of the same diameter, and the torch flame must be definitely carbonizing with the acetylene envelope approximately three times the length of the inner cone. Welding time will, of course, vary with the diameter of the valve, but in no case should a welding time of more than three minutes be required per valve.

After hard-facing, some companies replace the valve in the lathe or chuck it again, for removing high spots of the new metal before grinding to proper diameter and bevel. Others, finding the metal can be controlled within very close limits by proper correlation of rod size, flame and rotating speed of the valve, are able to attain desired finished contour solely through the grinding operation. Under most conditions, the preliminary or roughing cut over the newly deposited hard-facing metal, using a carbide-tipped tool and taking a very fine feed so as to leave a surface closely approximating that desired in the finished valve, will not only speed up the refinishing operation, but will also greatly cut down on wheel wear. And grinding wheels, in common with replacement valves, are priority-covered and can be used elsewhere if they are not required for frequent renewal in the overhaul shop.

Use of the hard-faced replacement valve, in conjunction with the usual insert seats of special heat and wear-resisting alloys, are found by many truck users to add 50,000 to 75,000 additional miles to the life of the valve. If valve and seat contours are matched and both are faced with metal resisting oxidation and the action of corrosive elements in the burned gases, it is rare for a motor to be consigned to overhaul solely for valve trouble; as it is likewise frequent that a motor, equiped with hard-faced valves, will go in for ring or other repairs and the valve check made at that time will show that no reconditioning, or even resetting of clearances, is required on the valves, even though the interval between checks may cover as much as 5000 operating hours.

Use of operating hours instead of mileage as a basis for truck engine performance comparisons is necessary when, as is common with much oil-field equipment, the driving motor also powers the winch and other auxiliary equipment, and may be utilized for days at a time in driving them, although the speedometer may show only a few miles of actual cross-country travel.



Chucked and trued on the grinding wheel, the valve is now ready for reinsertion in the engine, and should give from 50,000 to 75,000 miles of service before again requiring attention. If the grinding is properly done and the seat is either new or reconditioned, the contact area will soon develop a narrow band or ribbon of dull metal which withstands the erosion of burned gases and eliminates further setting of clearances.

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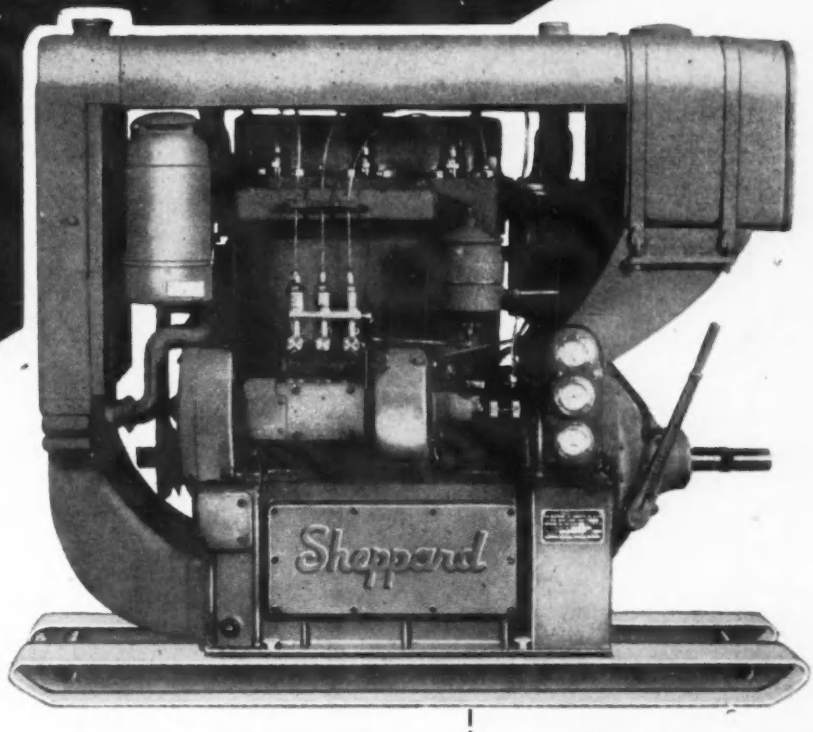

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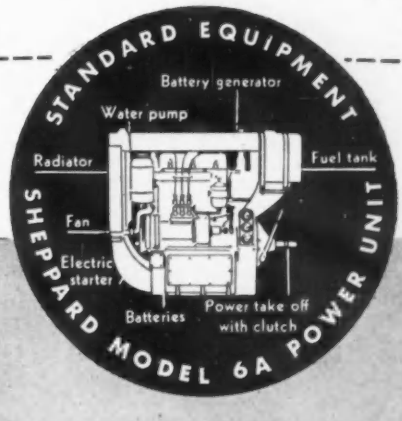

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Another Valuable "How" Article

How to Figure Pump Size

By E. N. KEMLER
Professor of Mechanical Engineering, Purdue University

THE problem of selecting proper size of pump for an oil well is very important, and one which has probably not received the attention which it deserves.

If a pump which is too large is installed it will get the production but the use of too large a pump means higher loads in the sucker rods and higher torques in the pumping equipment. If the well is not operated at the proper cycle with the large pump, fluid pounding will develop which in turn results in severe loading on sucker rods and tubing. The effect of fluid pound is very serious as far as sucker rod and tubing failures are concerned. While it is difficult to evaluate how much effect it will have on sucker rod life, elim-

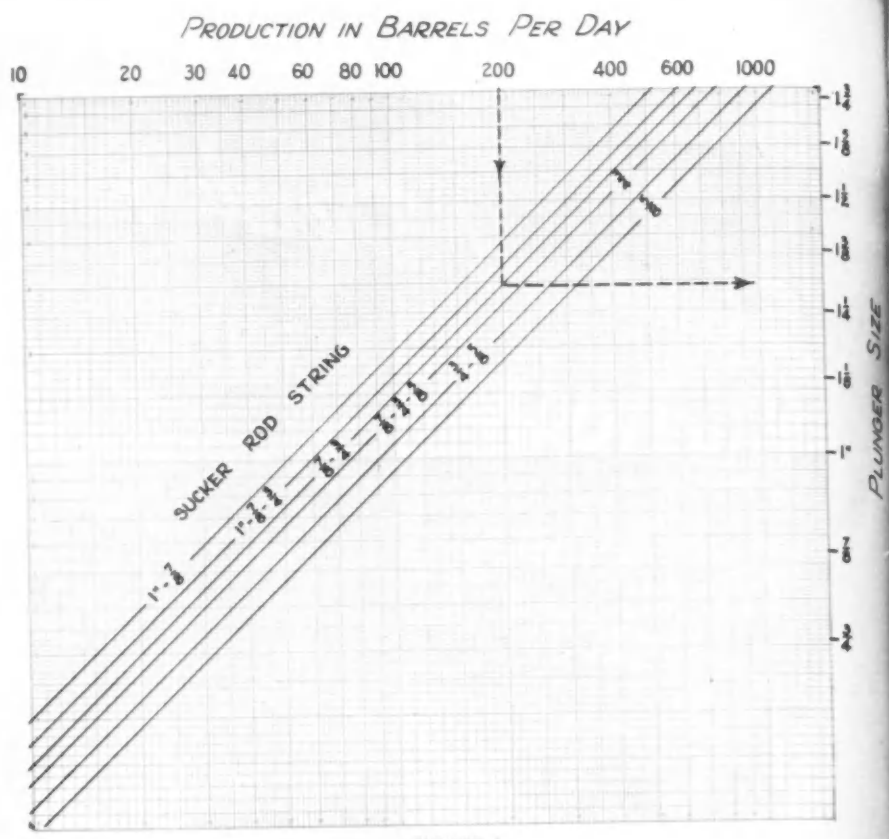


FIGURE 1

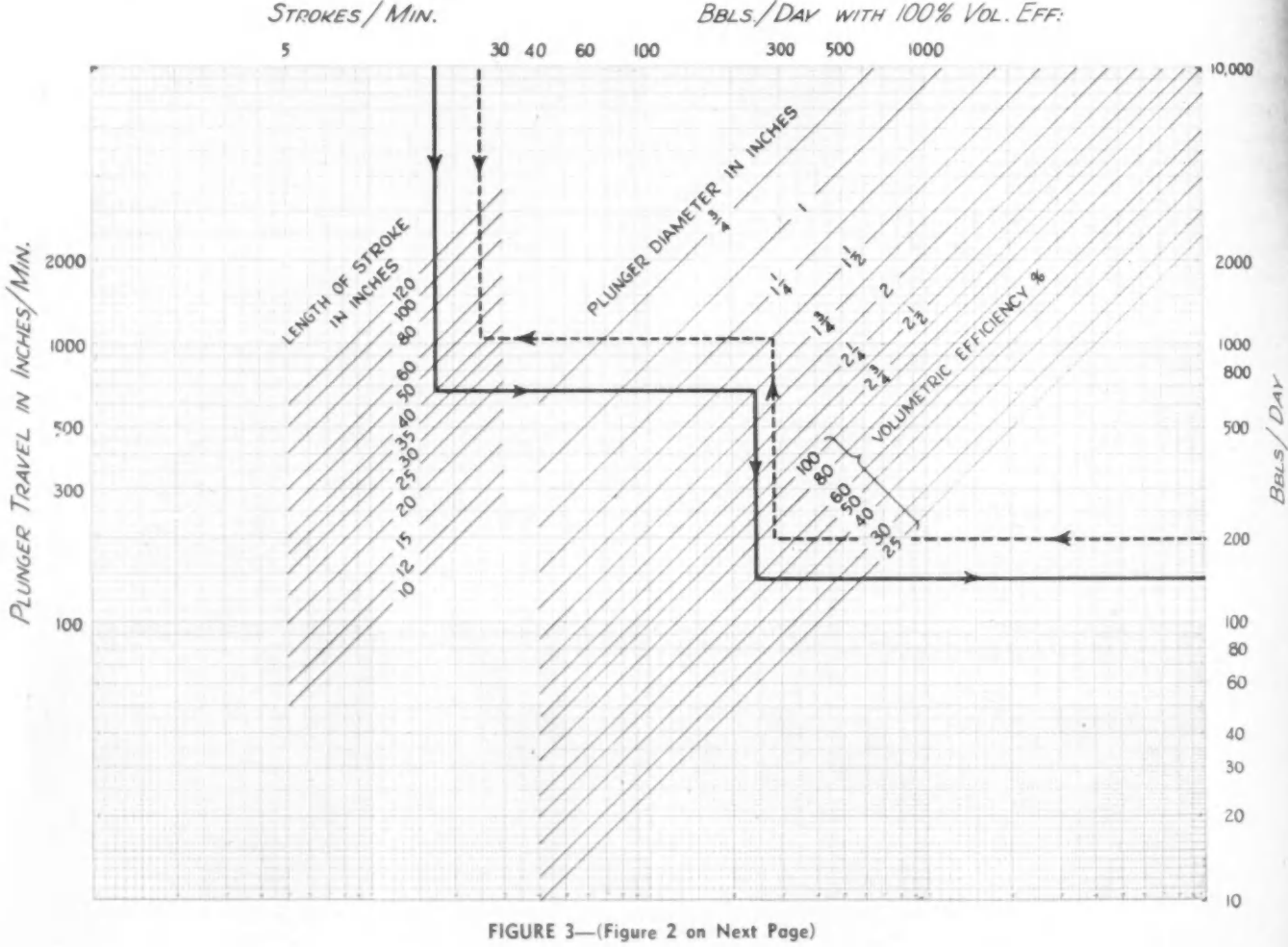
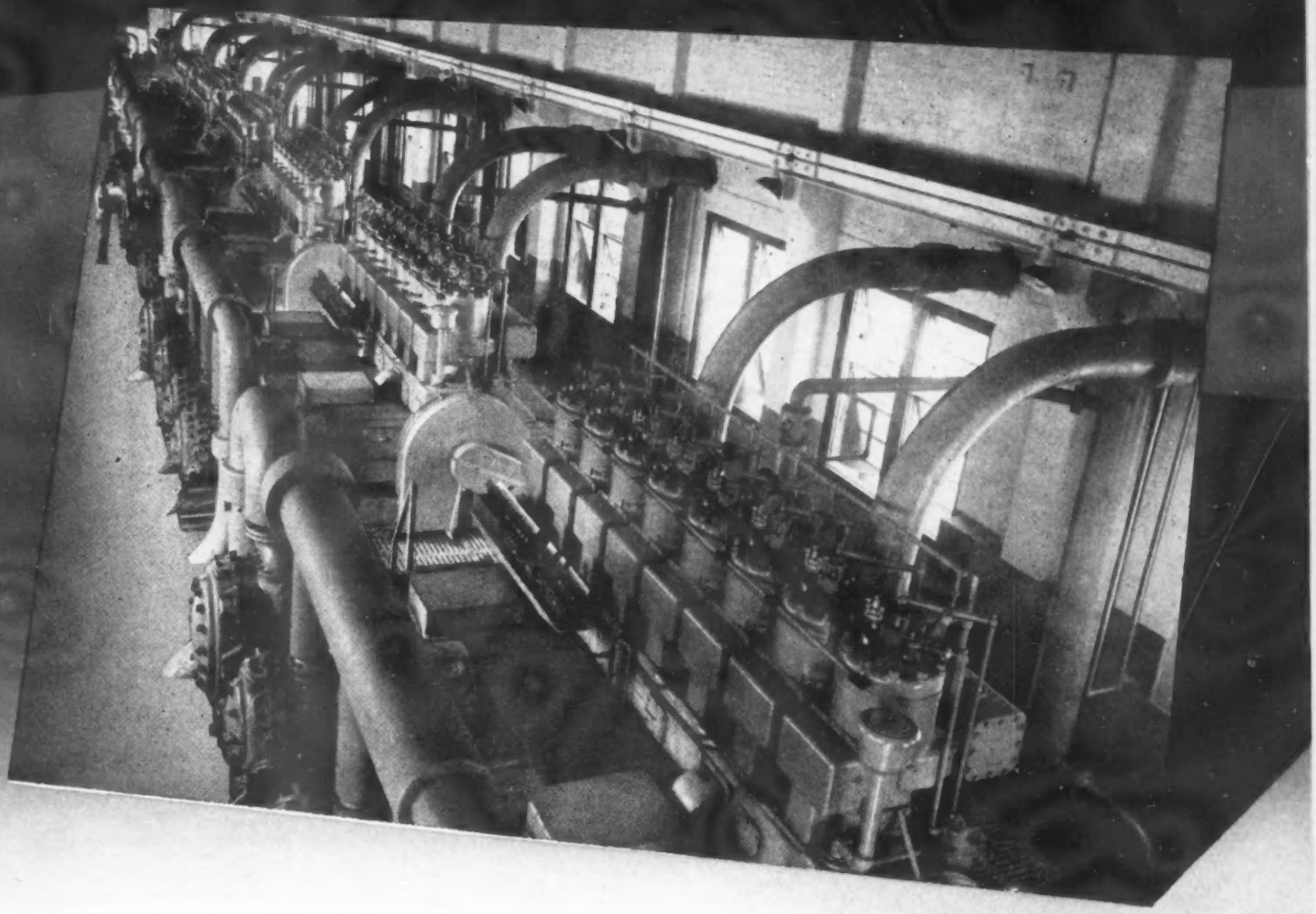

STROKES / MIN.
BBLS / DAY WITH 100% VOL. EFF:
PLUNGER TRAVEL IN INCHES / MIN.
BBLS / DAY
LENGTH OF STROKE IN INCHES
PLUNGER DIAMETER IN INCHES
VOLUMETRIC EFFICIENCY %

FIGURE 3—(Figure 2 on Next Page)

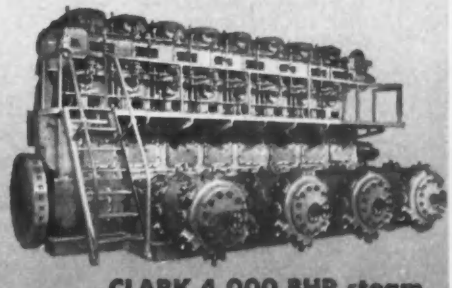
EERED" ANGLES
tadiene Project



The Clark Angles for the above shown ammonia refrigeration installation were also built in an unusually short time.

For special compressors and unusual operating conditions get in touch with CLARK.

7 CLARK 1000 BHP "Angles" in refrigeration service in one of the Butadiene plants



CLARK 4,000 BHP steam driven "Angle"

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. . . SETS THE PACE IN COMPRESSOR PROGRESS

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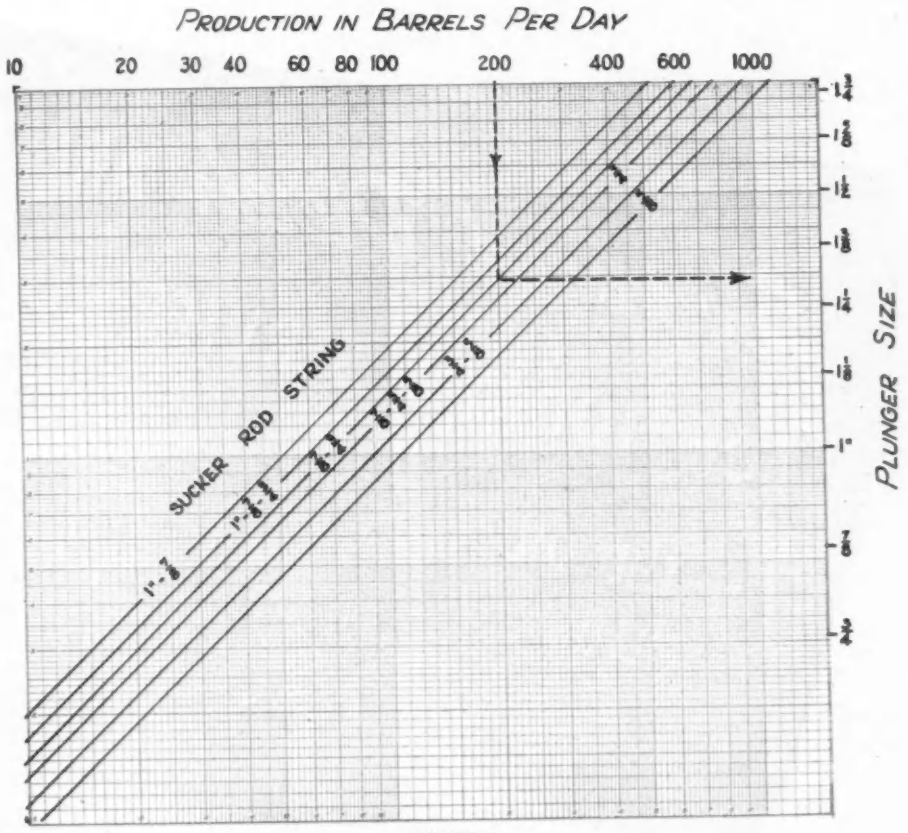


FIGURE 1

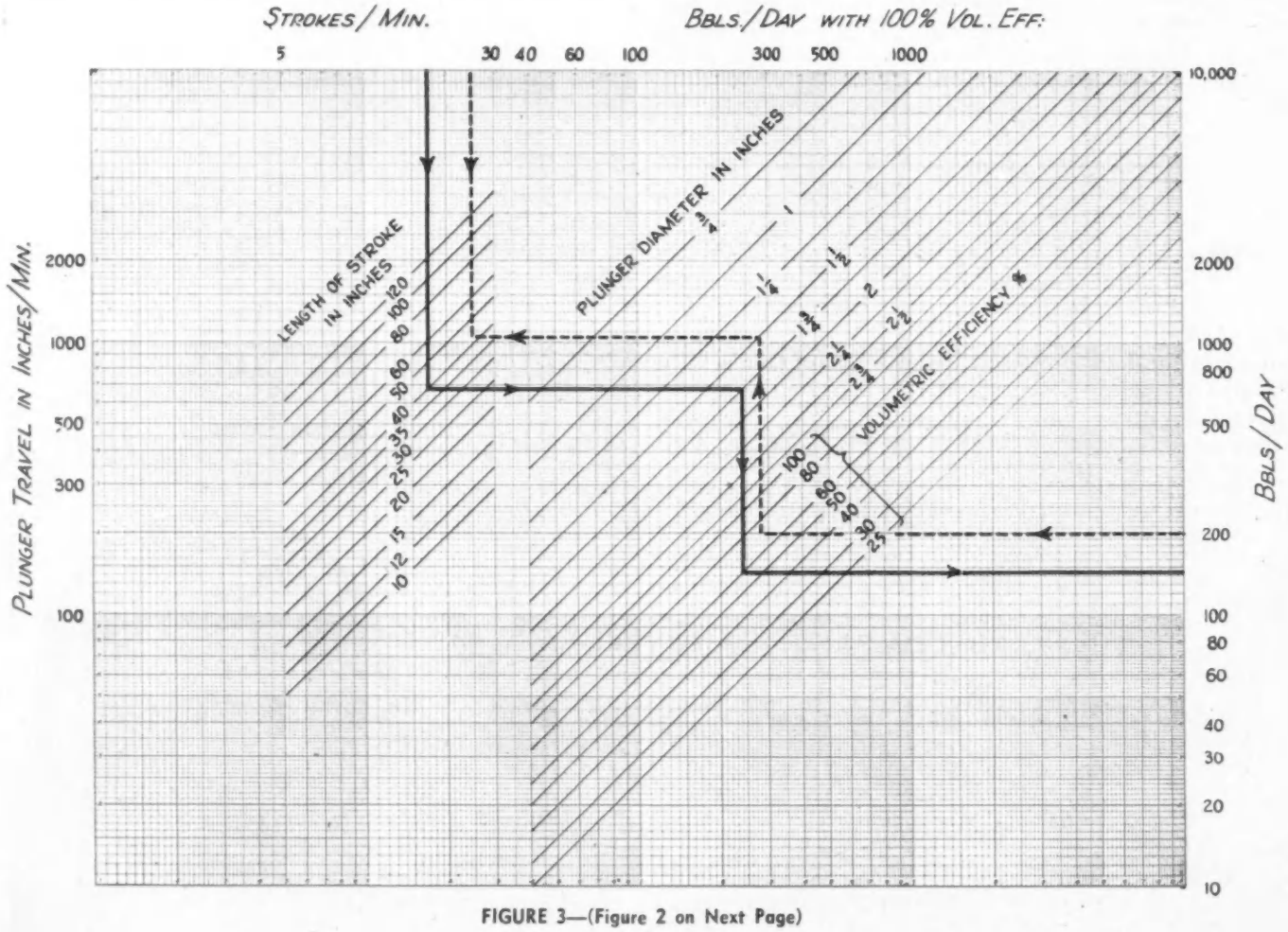
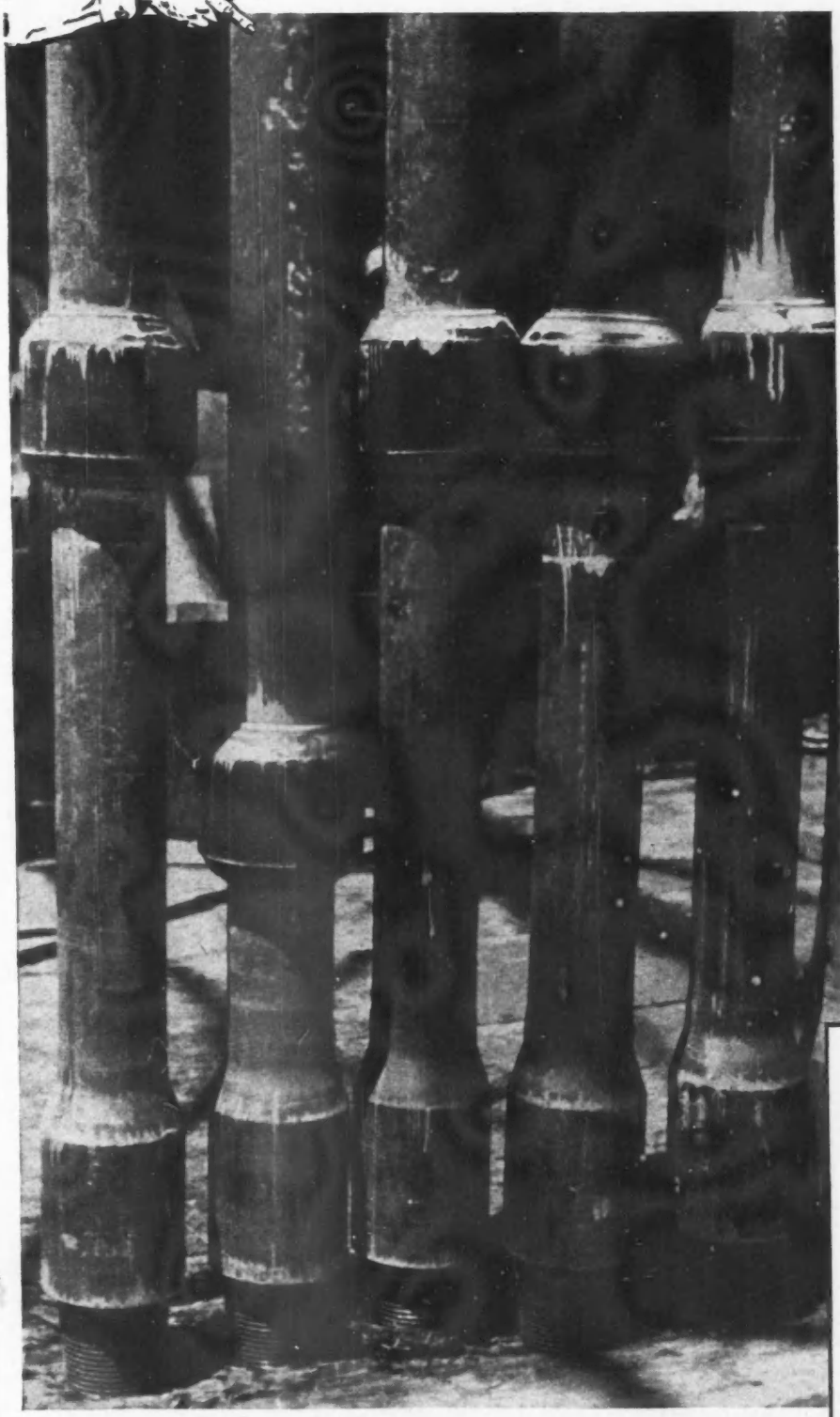

STROKES / MIN.
BBLS / DAY WITH 100% VOL. EFF:
PLUNGER TRAVEL IN INCHES / MIN.
LENGTH OF STROKE IN INCHES
PLUNGER DIAMETER IN INCHES
VOLUMETRIC EFFICIENCY %
BBLS / DAY

FIGURE 3—(Figure 2 on Next Page)

"By golly, you can still read the stencil marks!"



This string is being well cared for by a Patterson-Ballagh Pipe Wiper. Look further, see more evidence of the good work done by this valuable device. Note the tool joints, the floor under the threads—clean as a hound's tooth. Note the drill pipe itself—clean, not enough mud left to even drip from the Protectors. In addition, the Patterson-Ballagh Pipe Wiper reduces fishing jobs, saves costly mud weight material and has other valuable features. Located under the master bushing, it is easy to install.

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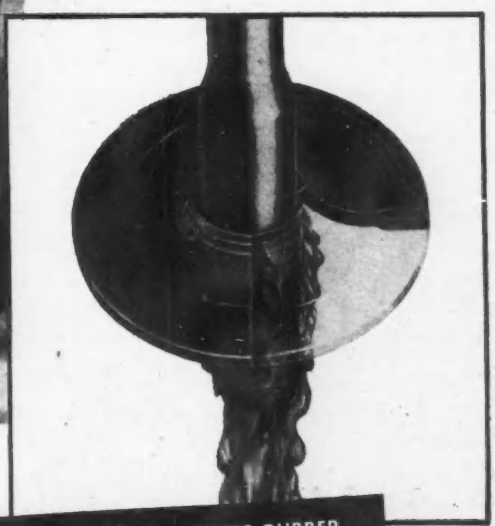

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PATTERSON-BALLAGH PIPE WIPERS

CLARK "ENGIN
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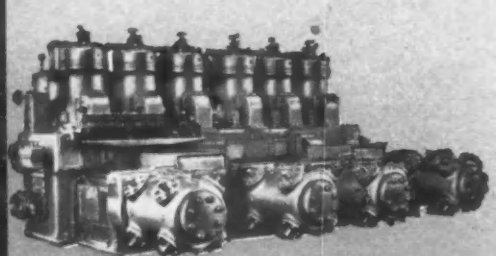
12 CLARK "Angle" Compressors totalling 7,500 BHP, in one of the Butadiene plants

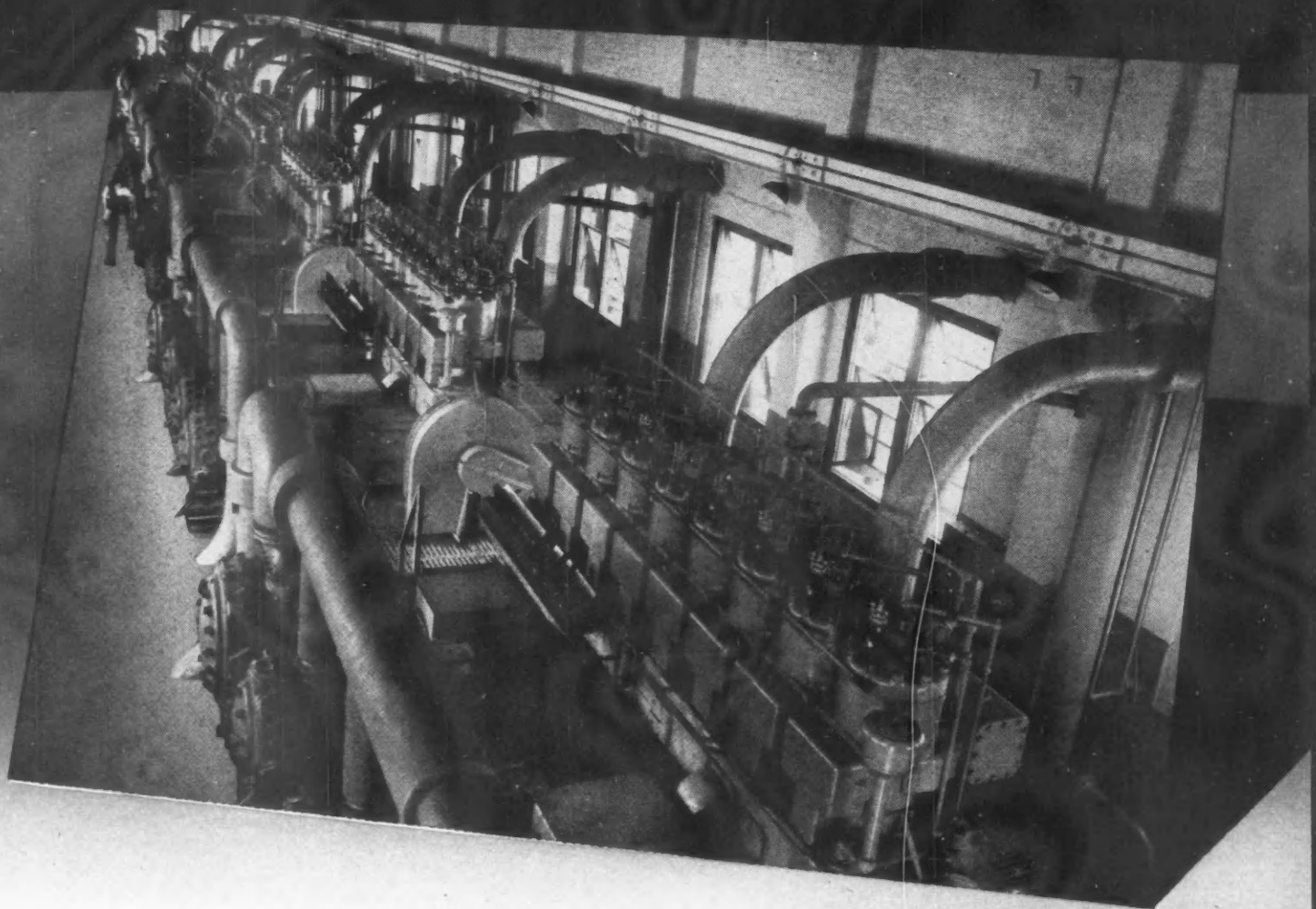


CLARK 6-cylinder, 750 BHP supercharged gas-driven "Angle"

The Clark Angles in the huge California Rubber project are typical of what the Clark organization can and is willing to do for special engineering problems in the handling of hydrocarbon gases.

The Clark Angles shown above, in one of the Butadiene plants, were specially engineered and built for the unusual operating conditions in this plant. In spite of the pressure of large and urgent war contracts, Clark engineered and built special tandem double-acting compressors needed for this application, in record time.

NEERED" ANGLES
tadiene Project



7 CLARK 1000 BHP "Angles" in refrigeration service in one of the Butadiene plants

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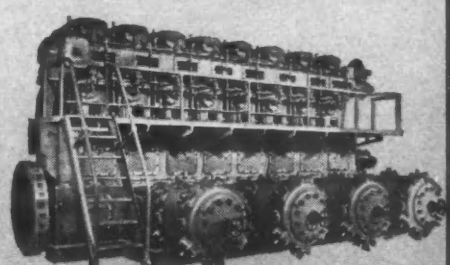
For special compressors and unusual operating conditions get in touch with CLARK.



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CLARK

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. . . SETS THE PACE IN COMPRESSOR PROGRESS

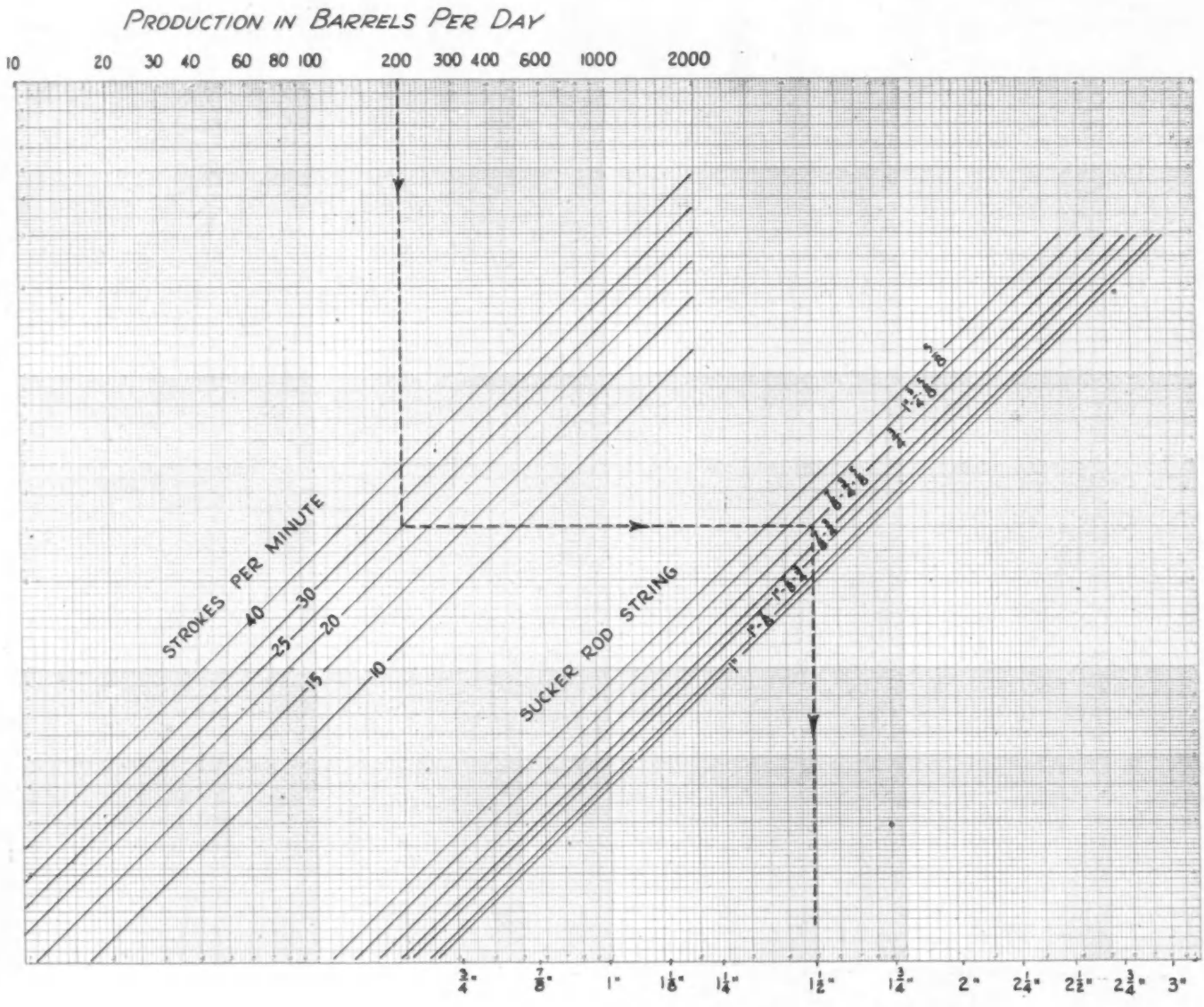

FIGURE 2

ination of fluid pound will in many cases give much longer rod life.

When too small a pump is installed the available production will not be obtained or in case of a prorated well, longer pumping hours must be used. When production can not be obtained with normal pumping hours it may be possible to increase the pumping cycle or stroke. Since tests are generally made to check on the capacity of wells produced, difficulties which result from too small a pump are usually soon corrected in the field. Difficulties from overpumping, however, are not generally given proper consideration.

The determination of the best plunger diameter to use is not so obvious a procedure since the plunger size affects sucker rod load and torque on pumping equipment as well as sucker rod life. An analysis made using average values of specific gravity of fluid and volumetric efficiency and based on the Slonneger[1] formula for well loads gives the relation between plunger size and production which can be expressed in the form[2].

$$d = \left(\frac{KQ}{126}\right)^{1/4}$$

where d = plunger diameter in inches
Q = production in barrels per day
K = Average weight per foot of sucker rod string.

Figure 1 shows in graphical form a plot on the basis of various sucker rod strings which might be used. The example shown in Figure 1 shows the proper plunger size from the standpoint of the sucker rods which should be used on a well with a production of 200 barrels per day equipped with a ⅞-¾-inch string of sucker rods. The optimum plunger size can be found by tracing down from 200 barrels a day to the ⅞-¾-inch sucker rod string line and then across and reading a plunger size somewhere between 1¼ and 1⅜-inch. In this case the next larger standard plunger size in use would be used. This might be 1½ inches for example. Once this pump size has been determined it is possible to go ahead with calculations on the pumping cycle which are required to get the production with this size pump.

A similar analysis based on a formula proposed by Mills gives the optimum pump size in the form

$$d = \left(\frac{K Q N}{2750 e S}\right)^{1/4}$$

where N is the strokes per minute
e is the volumetric efficiency
S is the average specific gravity of the fluid.

For values of e and S equal to 70 percent and 0.85 respectively this equation reduces to

$$d = \left(\frac{K Q N}{1600}\right)^{1/4}$$

The solution to this equation is shown in Figure 2. The plunger size for the previous example is found by entering at the upper scale for production in barrels per day, tracing down to strokes per minute = 25, then across to the line for ⅞-¾-inch sucker rod string and down, giving a 1½-inch plunger. This plunger size is somewhat larger than that indicated by the other chart. For larger productions Figure 2 should give values more in line with practical operating cycles.

Because of the complicated nature of the fluids handled and conditions under which a pump operates, there are frequently difficulties of determining how much production an oil-well pump will handle. The motion of the plunger for example will not in general be the same as the motion of the polished rod. For the very high pumping speeds such as has been used for potential tests the

■ CONTINUED ON PAGE 30

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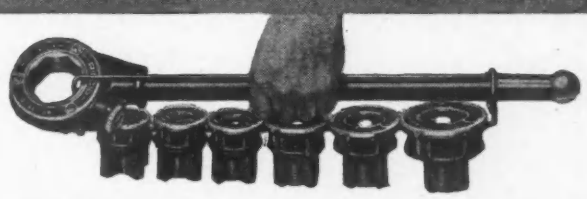

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Russia Gets Rid of Japs—

Sakhalin Island Has Good Possibilities

Important oil resources of largest of islands off Russian coast will no longer aid Jap war machine

By DON L. CARROLL, Staff Writer

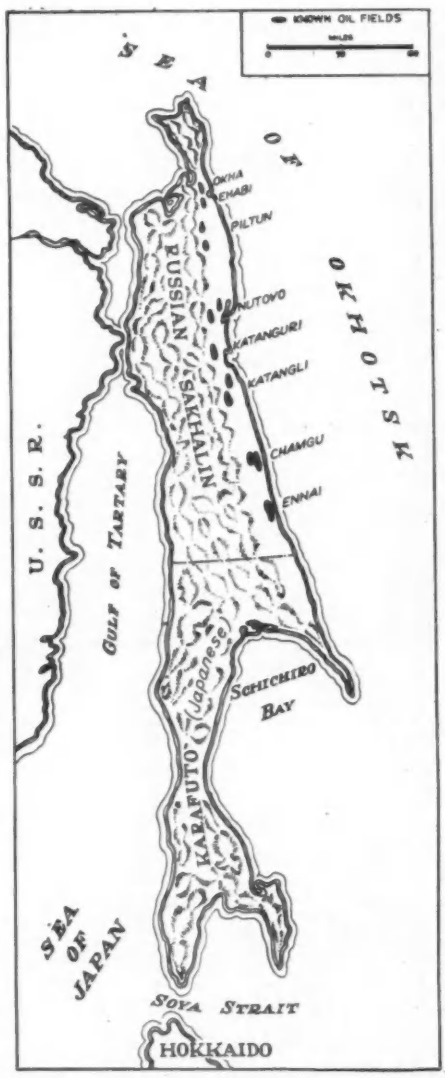
RECENT action of Soviet Russia, ending its agreement with Japan concerning exploitation of the oil resources of Sakhalin Island, has aroused some curiosity and interest as to the situation itself and the relative importance of the island's oil fields. A review of available information reveals a number of surprising facts.

In the first place, Sakhalin is not just another island off the coast of Asia. It is the largest of all islands off Russia's thousands of miles of coastline. It is approximately 600 miles long, and up to 100 miles in width. Its area of nearly 25,000 square miles is equal to the combined areas of Connecticut, Massachusetts, Rhode Island and Vermont or about 20 times the size of Long Island. Geologically, it is a part of the Japanese archipelago, and is separated from Japan's second largest island of Hokkaido by only 20 miles of water. The southern half of the island, known as Karafuto, is owned by Japan.

Unfortunately for the Japanese, the oil resources of Sakhalin seem to be confined to the northern, or Russian, half of the island, along a belt bordering the eastern shore. The belt is some 25 miles in width and approximately 250 miles in length. Oil is found in Miocene and Pliocene rocks that make up a section totaling as much as 30,000 feet in thickness within the narrow belt. These oil-bearing rocks are bordered on the west by metamorphosed Paleozoic rocks that form the mountainous backbone of the central and western part of the island throughout most of its length.

Diplomatic History of Development

The southern half of the island (Karafuto) was ceded to Japan by Russia in accordance with the provisions of the treaty of Portsmouth, at the end of the Russo-Japanese war, in 1905. Then, in 1918, Japan sent a force of 75,000 men into Siberia, to "cooperate" with the American expeditionary force in rescuing a Czechoslovak regiment that was supposed to be lost somewhere east of the Urals. The Japanese proceeded, instead, to take over control of southeastern Siberia, and were not ejected until 1922; and even then they retained control of Sakhalin Island for three more years. They were induced to withdraw from the northern part of the island in 1925, by virtue of grants of important concessions for coal and oil exploitation. This arrangement was included in the treaty of Peking, and granted exploitation rights for a period of 45 years, on 8 tracts, aggregating 14,000 acres in the semi-proven oil fields of Northern Sakhalin. The tracts were checkerboarded into 100-acre squares, owned alternately by Russia and Japan.



Sakhalin Island, showing alignment of known oil fields along east coast of northern, or Russian half. Oil-bearing Tertiary rocks are limited to eastern coastal plains.

The treaty contract also granted to Japan, for 11 years, the exclusive right to explore the oil and gas resources of an additional 280,000 acres within the oil field area, and to select 2800 acres each year for development. The selected blocks were likewise to be checkerboarded into 100-acre parcels, and alternately owned. The Japanese agreed to pay royalty ranging from 5 to 15 percent, according to quantity of output.

The Soviet government retained the right to lease its alternate parcels to any approved applicants. Thus, the Sinclair Oil Corporation obtained a concession from the Russians, and sent geologists and engineers to make a preliminary survey. The Americans were immediately arrested by the Japanese and returned to Vladivostok under military escort. After that, not even the Russians were allowed on the island for some time.

Under the new agreement, concluded on March 31, 1944, Japan will be unable to obtain any further supplies of oil from Russian Sakhalin until after the war except for removal of stocks in storage. Thus as a result of Allied military successes, and Russian victories in particular, Japan has given ground in the face of diplomatic pressure, and has agreed to cancel the agreement 26 years ahead of its expiration date. In return, Russia is to pay Japan 5,000,000 rubles for surface equipment and other field installations, and has agreed to sell to the Japanese, at commercial rates, 50,000 metric tons of Sakhalin oil per year for five years—"after the termination of the present war."

Commenting on the recent negotiations, the official Soviet newspaper Izvestia has pointed out that under the terms of the 1925 treaty, Russia was granted option of requiring the Japanese to liquidate some of the concession properties between the years 1936 and 1941. Notice was duly served by the Russian government, but the Japanese disregarded the requirement. When the Russo-Japanese neutrality pact was signed in April, 1941, Japan again agreed to settle the matter within six months, but failed to make any effort to do so until Russia took the initiative this year, forcing the Japanese to clear out of northern Sakhalin.

The Russian Sakhalin Oil Trust was formed in 1928, and since that time has developed considerable acreage in field areas opened and proved by the Japanese. This trust has now taken over all operations north of Karafuto.

Sakhalin Production

The Sakhalin fields are said to have produced more than 5,000,000 barrels of oil in 1943. This seems conservative, since it is known that 3,869,000 barrels were produced there in 1939, and that the Japanses have been especially industrious in their efforts to boost production from Sakhalin properties during the war period.

By 1930, production from Russian-operated wells on the island had totaled slightly more than 50,000 barrels per month. By 1939, it had grown to 250,000 barrels per month, and is probably somewhat higher now. Japanese wells, on the other hand, produced no more than 80,000 barrels per month in 1939, but the Japanese were buying all of the Russian production they could get. The crude was being used directly as fuel for warships operating in the northern Pacific, although it is estimated that 1,250,000 barrels were transported to

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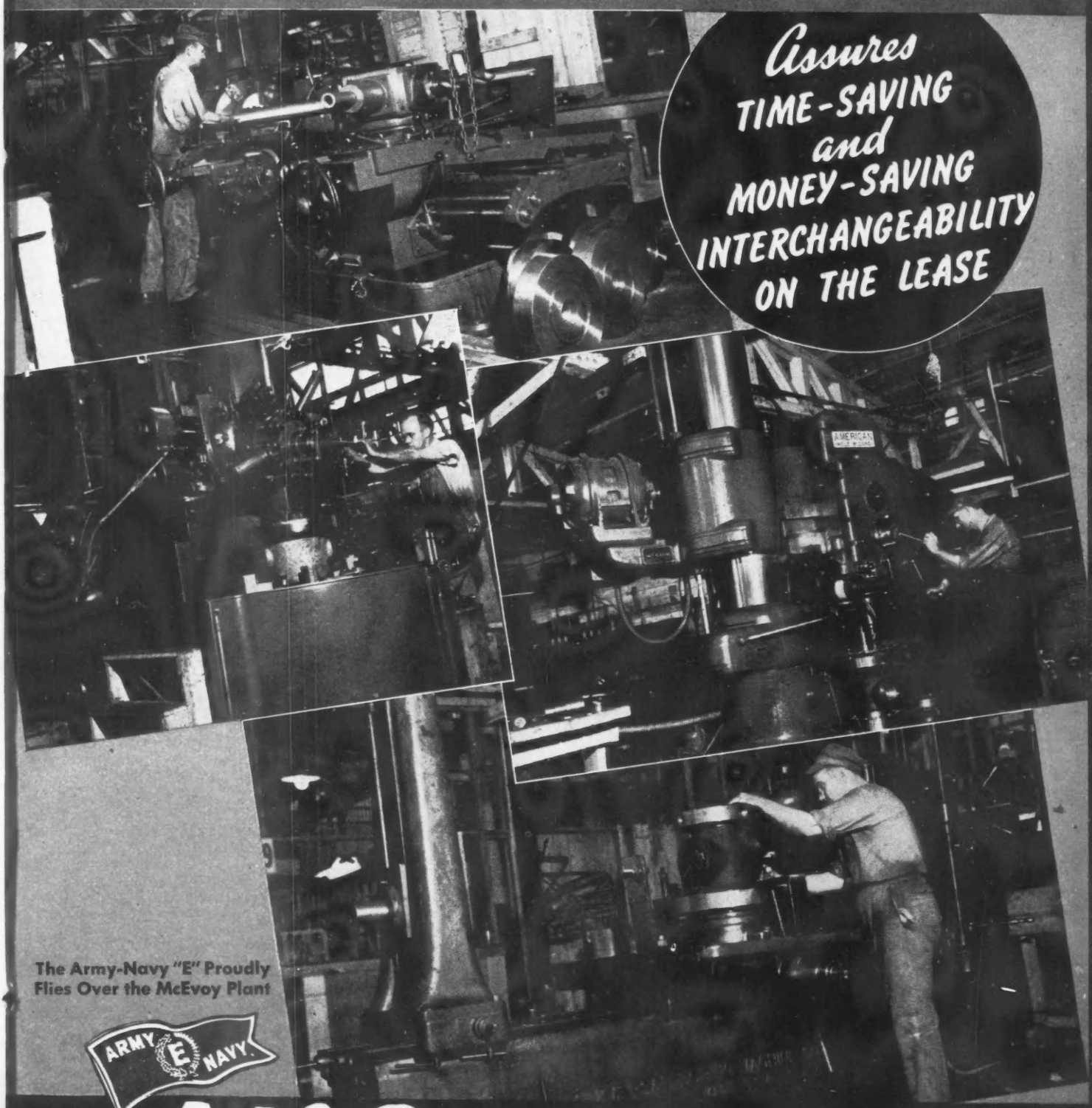

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Japanese refineries in 1939. Since the beginning of the war the policy of the Japanese has been to force wells to the limit on Russian-controlled tracts, and to conserve proved reserves as much as possible within the tracts under their own control. These hoarded reserves are now in Russian hands, and Japan has irretrievably lost this backlog.

Geology of Oil Belt

The narrow belt of thick Tertiary sediments along the east coast of Sakhalin Island apparently represents uplift and folding of a relatively small segment of a geosyncline that has been receiving marine sediments continuously since Oligocene time. This geosyncline is assumed to be equivalent in area to that of the Sea of Okhotsk, which is completely bounded by mountain chains that are partly submerged around the southern margin of the negative area, forming the island chain of the Kuriles, Hokkaido, and Sakhalin itself. Only at the northern end of Sakhalin are Tertiary rocks found in the mountain belt that is otherwise limited to occurrences of Paleozoic rocks.

Between the mountains and the east coast the Miocene and Pliocene series of sandstones, shales and sandy shales are folded and faulted along uniformly parallel north-south trend lines that almost exactly follow the regional strike of the strata. Every oil occurrence so far discovered on the island has proved to be an accumulation within anticlinal structure. The faults are apparently not sealed, since oil seeps are common along their outcrop lines, producing extensive deposits of asphalt-cemented gravels within the thick Quaternary mantle that covers the Tertiaries east of the basin boundary. This mantle and the tundra mat above have produced a paucity of Tertiary outcrops that is typical of the subarctic region and greatly hampers surface geological work. Anticlinal structure, however, is frequently reflected in the surface topography of the tundra plain. This indicates that the folding of the Tertiary section was either a very recent geological event or that it is still in progress.

Well cuttings and border outcrops show a basal Miocene conglomerate at the bottom of the section, resting on the disconformable Paleozoic surface that dips rapidly downward to the east. The variation in thickness of the oil-bearing section from 2000 feet in extreme northern Sakhalin to some 30,000 feet near the Karafuto boundary indicates no change in the regional dip rate of the Paleozoic surface. Rather it is due to the fact that the width of the Tertiary belt is greater to the south, where the distance from the western mountains to the eastern seacoast reaches a maximum.

Dozen Separate Pays

Oil is present in a thick shale series lying almost immediately above the basal conglomerate. Intercalated within the shale beds are lenses of sandstone and several extensive beds of pumiceous sandstone that are found to be well saturated with oil where they have been tapped on structure or where they outcrop here and there in the northern part of the island. The shale member is probably of middle Miocene age, and is likely the main source bed of the oil found in this and higher sands of upper Miocene and Pliocene age. No beds below the Pliocene have been tested in the oil belt except in the northern half of the area. The possibilities deserve investigation along the western margin of the belt throughout its length. The Pliocene alone attains a total thickness of almost 10,000 feet in the vicinity of Cape Ratminoff, north of the Karafuto border. It is made up of a series of alternating sandstones and conglomerates in the lower portion, and thin shales and calcareous, lenticular sandstones in the upper part. More than a dozen separate pays have been determined in the upper section alone.

Between the thick source-bed shale of the middle Miocene and the Pliocene strata mentioned above, lie 5000 feet of massive sandstones, overlain by about 10,000 feet of dark gray shales and sandy shales that so far have yielded the greater portion of the oil taken to date from the Sakhalin fields. The four largest fields, Okha, Ehabi, Nutovo and Katanguri produce from this upper Miocene section.

It is not possible to find out what the Japanese, or the Russians either, have been doing in the way of exploration and development on the island in the past two or three years; but undoubtedly a number of new fields have been found. Even as far back as the early 1930's much of the drilling there was being done with rotary equipment. It is to be assumed that all recent discoveries have been quickly followed up by development, to prove productive acreages.

Pump Sizes

■ CONTINUED FROM PAGE 26

plunger may have more travel than the polished rod and will consequently give a larger production than the theoretical value. At very slow pumping cycles under-travel may be experienced thus indicating low apparent volumetric efficiencies. Where free gas or gas which comes out of solution and gets into the plunger barrel the volumetric efficiency may be very low. Under such conditions it is not possible to predict ahead what might be expected for an average value of volumetric efficiency. Values for volumetric efficiency of from 50 to 100 percent are quite common with 70 percent being a safe value for normal operations. On wells producing small amounts of fluid the pumping cycle is usually made so high as to result in values as low as 10 to 20 percent. Where gas is a serious problem correspondingly low values may also be found.

Use of Chart

The chart shown in Figure 3 can be used to determine the production which can be obtained with a given pump and pumping cycle. As an example consider a well making 17 strokes per minute, 40 inch strokes with a 1¾-inch bore plunger and 60 percent volumetric efficiency. To use the chart enter it on scale marked strokes per minute traced down to length of stroke in inches as indicated by arrow, then across to plunger diameter in inches, trade down to volumetric efficiency and across to find production of 145 barrels per day.

Where all but length of stroke are known it is necessary to trace from both ends and find the length of stroke at the intersection of two lines. Consider as an example the previous problem where a 1½-inch plunger, 70 percent volumetric efficiency, and 25 strokes per minute are used to produce 200 barrel per day. Enter chart at 200 barrel per day as indicated by dashed line, trace across to 70 percent volumetric efficiency, then up to 1½-inch plunger diameter. From there trace to left on dotted line as indicated. The length of stroke can be found by tracing down from line for strokes per minute = 25 until this line crosses line to left of plunger diameter. At intersection read a 42 inch stroke. This chart can be used for calculating volumetric efficiency in a similar manner.

The production can also be calculated using the formula

Bbl/day = K x strokes/min x length of stroke in inches x volumetric efficiency.

Table 1 lists values for K to be used in this relation. For the first example using Figure 3 we find K = 0.357 for a 1¾-inch plunger.

Q = 0.357 x 17 x 40 x 0.6 = 146 bbl/day.

REFERENCES

[1] API Standards 11E on rating of pumping equipment.

[2] "Selection of Pump Size" by E. N. Kemler, The Oil Weekly, April 28, 1941, pages 17-20.

[3] "Factors Influencing Well Loads Combined in a New Formula" by K. N. Mills, The Petroleum Engineer, April 1939, page 27.

Table 1.

Plunger Diameter	Pump Capacity Constant K.
⅞	0.089
15/16	0.102
1"	0.117
1¼	0.182
1 7/16	0.241
1½	0.262
1¾	0.357
1 13/16	0.383
2	0.466
2¼	0.590
2½	0.728
3	1.05

Map Shows Variation In First Berea Sand

Local variation in the thickness of the First Berea sand, one of the most important oil- and gas-producing formations in Ohio, is a factor controlling the occurrence of oil in the sand, according to William E. Wrather, director of the Geological Survey, of the Department of the Interior. A map has been released which shows local variations in thickness of the sand and the locations of the existing oil and gas fields that are productive from the sand throughout an area in southeastern Ohio and western West Virginia. The variations in the thickness of the sand are shown by lines indicating equal thickness, drawn at intervals of 20 feet, and also by patterns of diagonal lines. The map, which covers an area of nearly 9000 square miles, has been prepared from a study of the logs of more than 5000 wells.

The First Berea sand is exposed on the surface near the west margin of the area and is found at a depth of approximately 1900 feet in the southeastern corner. It ranges in thickness from less than a foot to more than 100 feet, but in northern Ohio outside the limits of this area it is locally as much as 200 feet thick.

The map of the First Berea sand has been issued as Preliminary Map 9 of the Oil and Gas Investigations series. Copies may be purchased from the director of the Geological Survey, Washington 25, D. C. at 50 cents each.

Matilda has the answers

Since we propose to tell you about smiting the enemy with an airplane which cannot fly, maybe we'd better start by reminding you how the Greeks licked ancient Troy—with a horse that couldn't run. That Wooden Horse — its innards crammed with the first paratroopers — is history. Tomorrow *Matilda* will be history.

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Actually, *Matilda* is just the mechanical essence of an airplane, set up in the Richmond laboratories of our new subsidiary, The California Research Corporation. Her job is to help our planes outfly the Germans and the Japs—faster . . . farther . . . higher. This she does by giving our scientists the answers about improvements in airplane fuel and lubricants.

As research experts figure out new things that *should* work, *Matilda* tells them, cold-turkey, whether they *will* work. She simulates flight conditions. And on a variety of recording devices, she writes a "log" of everything that happens—down to the smallest knock.

Most of *Matilda's* accomplishments are military secrets. But it's all right to reveal that *Matilda* helped to give our flyers 100-octane gasoline when the best the enemy could do was 87-octane. She's one reason our Air Force could pace the Invasion by boldly taking on the Luftwaffe.

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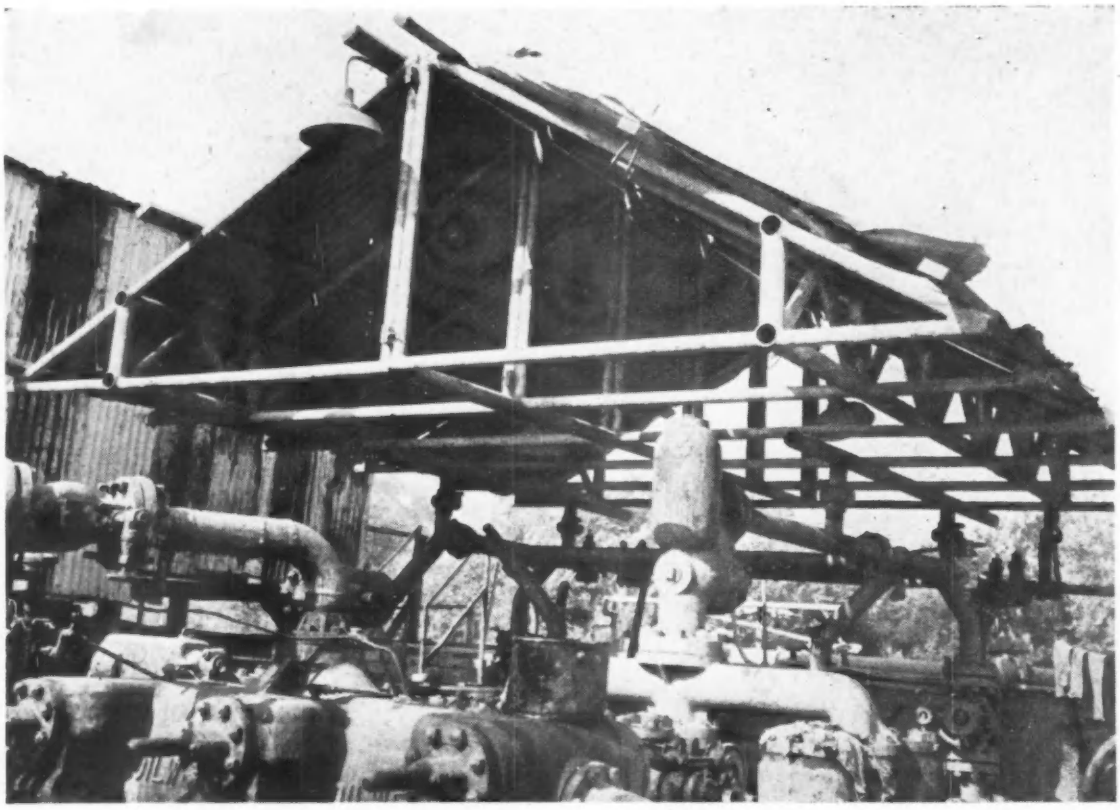

Triangular half-truss sections, formed by welding scrap pipe at desired roof pitch angle, rest on supports carried on fluid lines, and bolt together to form clear span allowing servicing and operation of pumps as though standing in clear. Sections, divided at center, stack readily for transportation without requiring excessive truck space.

Unitized Pump Shelter Saves Rigging-Up Time

Roof trusses for slush pump and mud control platform protection are prefabricated from scrap pipe, divided at peak lines, equipped with easily-joined connections

CONVERTING a tedious, time-consuming job into one of only a few minutes duration is the result of one company's effort to unitize the shelter structure used over mud pumps, mud-control platform and other power equipment. The all-welded shelter consists of two complete longitudinal sections built up of salvaged drill pipe and tubing and joined together at the ridge and at the junction of paired upright frame members by steel ears which line up and are bolted together. Contributing much to the speed of rigging up the shelter is the method of supporting and tying it down firmly. At two points atop each of the two horizontal mud-line connections between the pump and ditch are welded (blind) short upright sections of heavy drill pipe. A hammer-type union joins this nipple to another similar welded to the bottom side of a horizontal pipe extending longitudinally across the bottom of each of the two shelter halves. Four horizontal transverse members rest upon this horizontal support and are welded at each point of contact along this supporting pipe.

All that is necessary on dismantling the structure is to unscrew the four hammer unions, unbolt the ears joining the two sections at the center-line, and lift the units off and load them with a truck-mounted crane. Well braced internally, the assembly is sturdy and capable of withstanding rough handling and the occasional windstorms which raise havoc with shelters of this kind. Corrugated sheet iron is left on the two sections permanently, the material being nailed to longitudinal stringers of 2x6 lumber bolted along its length at the proper position to accommodate the 7-foot sections of sheet metal. Permanent lighting connections are retained in the sections, it being necessary only to plug in the circuit to the power source on assembly at the new location.

Because of their rigidity, the horizontal sections of the shelter may be used occasionally to support a timber which in turn supports a light chain hoist for removing or overhauling heavy valves or pump liners. When racking, the two triangular sections may be stacked roof to roof, the resulting rectangular stack requiring minimum of yard space.

Carboniferous Age Rocks Of New Mexico Mapped

Possible traps for the accumulation of oil and gas are furnished by unconformities and wedge-shaped stratigraphic units that have been found in the rocks of Carboniferous age in the upper Pecos River and Rio Galisteo region, New Mexico, and that may continue under cover of younger rocks both to the northeast and to the south, according to William E. Wrather, director of the Geological Survey, Department of the Interior. These wedge-shaped stratigraphic units were formed during the deposition of sediments in an ancient basin between ridges of older crystalline rocks. A geologic map of the area across this basin has been made by the Geological Survey, and has been published on a scale of 1½ miles to the inch, together with a columnar section of the sedimentary rocks, a number of cross sections showing surface structure and inferred subsurface relationships, and an accompanying brief text.

The map shows detailed geology over a wide arc from Galisteo, in Santa Fe County, to Valley Ranch and Chapelle, in San Miguel County, an area of approximately 1200 square miles. The rocks mapped range in age from pre-Cambrian to Quaternary, and in lithologic character from complex metamorphic rocks and deep-seated intrusives to atlernating marine and continental strata. There are also shallow intrusive rocks of Tertiary age.

The geologic map of the upper Pecos River and the Galisteo region has been issued as Preliminary Map 8 of the Oil and Gas Investigations series. Copies may be purchased from the Director of the Geological Survey, Washington 25, D. C., at 30 cents each.

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Electrical Well Logging

By HUBERT GUYOD, Development Engineer,
Halliburton Oil Well Cementing Company

Although more and more Multiple Electrode Resistance curves are being introduced for the logging of wells, none of them alone is able to solve all the usual logging problems. A modern Electric Log comprises, therefore, several types of Resistance curves, each having its advantages and its limitations. The present article describes briefly the various electrode arrangements used to obtain the most popular curves

PART 4
Multiple Electrode Logging Methods

IT HAS been shown that the apparent resistivity given by the single-point resistance method is, in general, only slightly influenced by the original fluid of permeable formations. On the other hand, if adequate electrical measurements could be made somewhere outside of the imaginary sphere S, surrounding electrode C in Figure 3-4 given previously, the result would be related, to a greater degree at least, to the electrical properties of the zone not contaminated by the drilling fluid. Measurements might be made far enough from electrode C so that the response of the logging instrument would be influenced mainly by the material of this particular zone. This is the principle of the multiple-electrode logging methods.

There is an extremely large number of possible multiple-electrode methods. In surface exploration, where the electrode separations can be modified easily at will, the number of electrode configurations used in the field is extremely large. Each type has its particular applications, and the selection of a given configuration is done mostly according to the topographical and geological conditions and the problem to be solved. In well logging, conditions are rather standardized, problems are much the same, and the geological picture does not change much, at least in a given large territory. This simplifies considerably the logging operations because it permits solving most problems with the use of a limited number of electrode configurations.

Any multiple-electrode logging method belongs to either one of the two basic following classes:

1. The three-electrode methods
2. The two-electrode methods

At first sight, it would seem that if allowance is made for enough penetration effect, the type of electrode configuration used should be rather immaterial. As a matter of fact, in the case of a homogeneous medium, any electrode configuration will give an exact value of the specific resistance of the medium, regardless of the electrode separations and the geometry of the system. In the case of a non-homogeneous ground, however, this simple rule does not apply, and each system has its particular response, and therefore its own advantages and limitations. This explains the present practice of logging companies in recording several types of curves during each logging operation.

Number of Electrodes

In preceding discussion on the single-point method, there has been considered only one electrode, the logging electrode, which is lowered in the bore hole, and the resistance of which is measured. Actually, there is always a second electrode somewhere in the ground — at the surface, in general — to complete the electric circuit. Without this ground electrode, it would not be possible to send any electric current from the logging electrode into the formation, and therefore the measurement of the resistance of this electrode

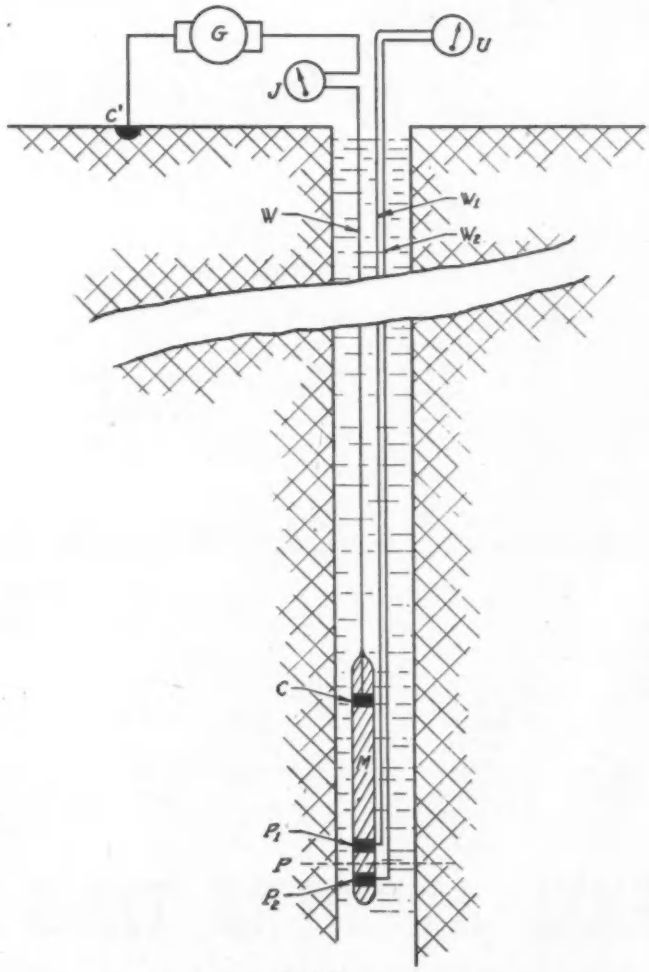

FIGURE 4-1
Electrode and circuit arrangement for three-electrode method (standard type).

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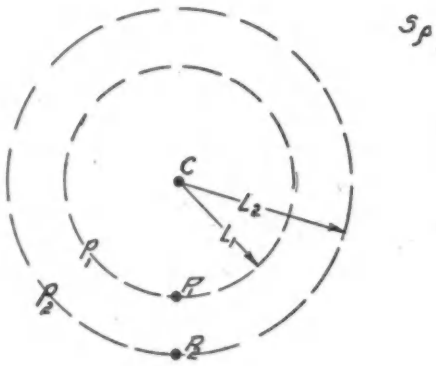

FIGURE 4-2

Computation of the resistance of the ground comprised between two concentric spheres.

would not be possible. (In the hydraulic circuit of Figure 2-3, the parallel would be the disconnecting of the water intake of the pump from the water tank. It is obivous that under such conditions, no flow of water could be maintained through the sand. See Part 2.) In general, the ground electrode is not considered because it has no effect whatsoever on the character of the resulting log. This electrode is nevertheless an essential component of the system. A single-point resistance arrangement therefore always comprises two electrodes, but only one of them is responsible for the log obtained.

In the case of the multiple-electrode methods, which shall be discussed here, there always will be four electrodes: two current electrodes C and C′, and two potential measuring electrodes, P_1 and P_2. For instance, the three-electrode method, actually refers to a four-electrode arrangement, of which only three of the electrodes are effective in producing the log, the fourth electrode being located anywhere at a great distance from the active electrodes. The two-electrode method also uses actually four electrodes, of which two are in the bore hole, the other two being far away, for instance, at the surface. Thus, electrically, all arrangements are four-electrode systems, although physically, the number of electrodes may be either two, three or four.

Because of the necessity of having the active electrodes inside of the bore hole, these electrodes are on a line which, for all practical purposes, can be assumed to coincide with the well axis.

Three-Electrode Method

Basically, the three-electrode arrangement has three electrodes in the bore hole: one current electrode C, and two potential measuring electrodes P_1P_2, as shown on Figure 4-1. These latter two electrodes are often referred to as the pick-up electrodes. Their distance, P_1P_2, is called the pick-up span, which is generally small compared with the distance between C and the midpoint P between P_1 and P_2. This distance CP is commonly called the "spacing," or "electrode spacing" of the arrangement. The second current electrode C′ can be anywhere far from CP_1P_2, and, in general, it is located at the surface. The electrode spacing can theoretically be of any desired length. It has been found, however, that when the three-electrode method is used, better logs are obtained generally when this distance is ten feet or more.

Previously it has been shown that the equipotential surfaces around a spherical current electrode C placed in a homogeneous and isotropic medium S of resistivity ρ are concentric spheres centered at C. The resistance offered to a current flowing from any one of these spheres p_1 to any other p_2, has been calculated in a previous article and found to be

$$R = \frac{\rho}{4\pi}\left(\frac{1}{L_1} - \frac{1}{L_2}\right) \qquad (4\text{-}1)$$

where L_1 and L_2 are the radii of spheres p_1 and p_2 respectively, as shown by Figure 4-2.

If I designates the intensity of the current leaving electrode C, and V the potential difference between the two spheres, the application of Ohm's law to the conductor comprised between these spheres gives

$$R = \frac{V}{I}$$

Combining the two preceding equations and rearranging, there results

$$V = \frac{\rho I}{4\pi}\left(\frac{1}{L_1} - \frac{1}{L_2}\right) \qquad (4\text{-}2)$$

This expression, which gives the potential difference V between any two points of a homogeneous ground as a result of the flow of a current I, is a fundamental equation in electrical logging.

Calculation of Ground Resistivity. If formula (4-2) is applied to the two points P_1 and P_2 of Figure 4-2, there can be written, after substituting CP_1 for L_1 and CP_2 for L_2

$$\rho = \frac{4\pi V}{I} \times \frac{CP_1 \times CP_2}{P_1P_2} \qquad (4\text{-}3)$$

The current intensity I can be read at the surface on an ammeter J. V can be measured also at the surface on a voltmeter U if adequate connecting leads are provided. Distances P_1P_2, CP_1 and CP_2 are known. It is therefore possible to compute the specific resistance of the ground by substituting in equation 4-3 the actual values for the above symbols.

The circuit arrangement for carrying out the above mentioned operations is schematically shown on Figure 4-1. C, P_1 and P_2 are for instance metallic rings mounted on a rigid rubber mandrel—or any non-conducting support—M suspended on a line comprising three insulated wires W, W_1, W_2, connected to electrodes C, P_1, and P_2 respectively. The other end of wire W leads to a constant current generator G, whose other terminal is grounded at C′. The other ends of wires W_1 and W_2 are connected to a sensitive voltmeter U placed at the surface. The logging assembly CP_1P_2 is moved progressively in the hole by means of a reel — not shown on the figure — while measure-

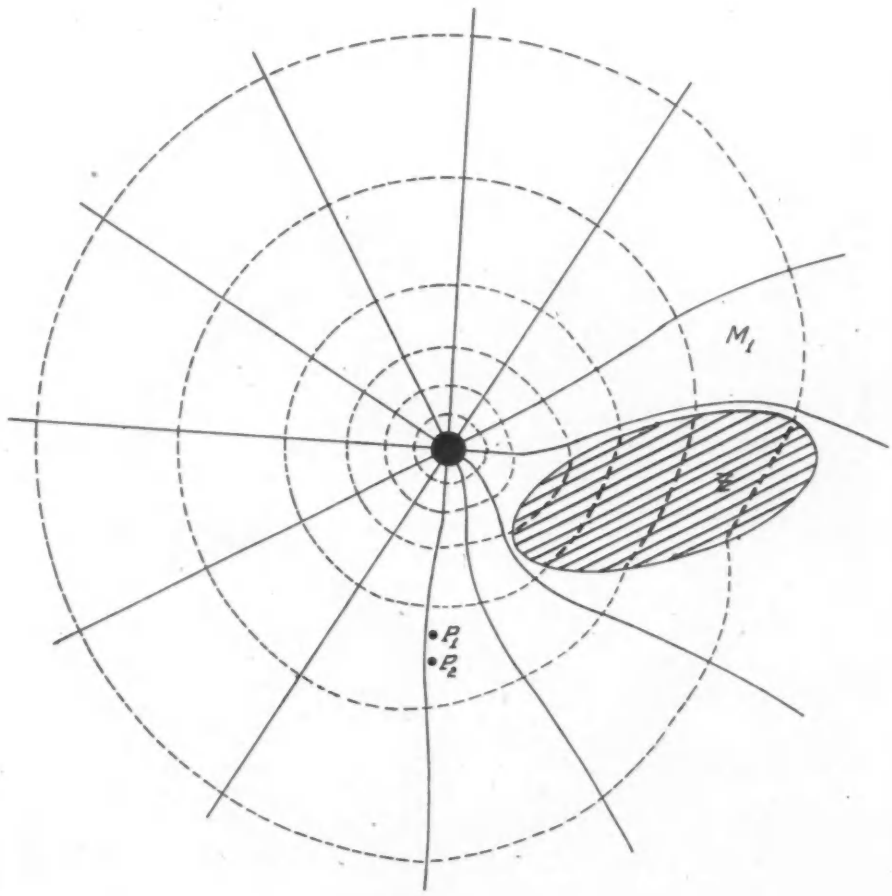

FIGURE 4-3

Current and potential distribution in the vicinity of an electrode placed in a non-homogeneous ground (resistant body in a conducting medium).

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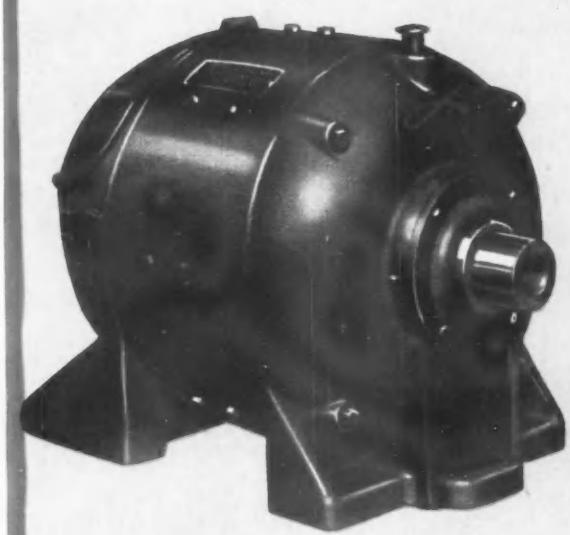

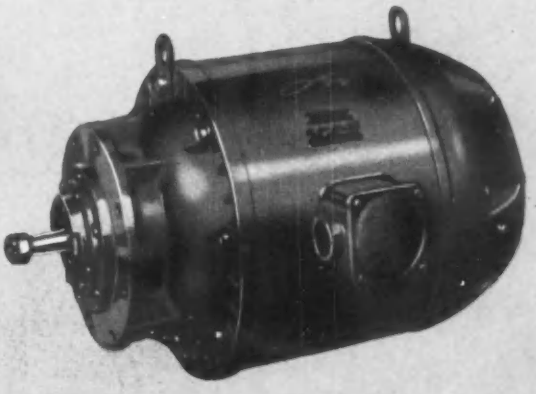

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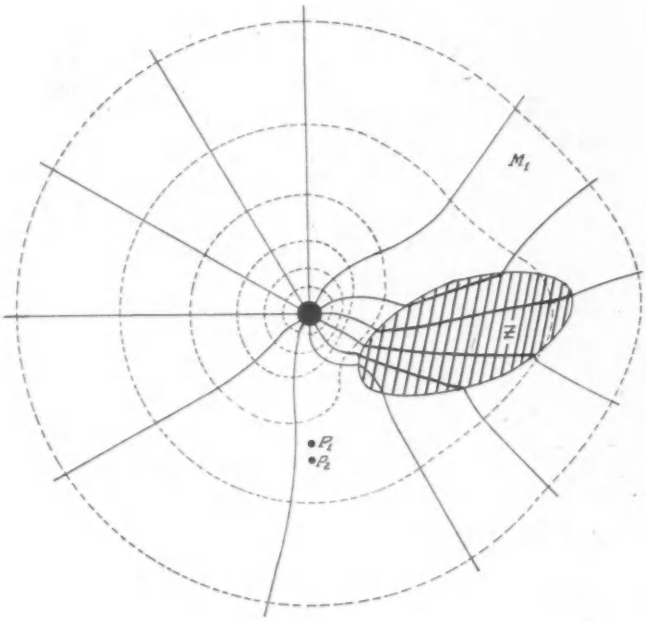


FIGURE 4-4

Current and potential distribution in the vicinity of an electrode placed in a non-homogeneous ground (conducting body in a resistant medium).

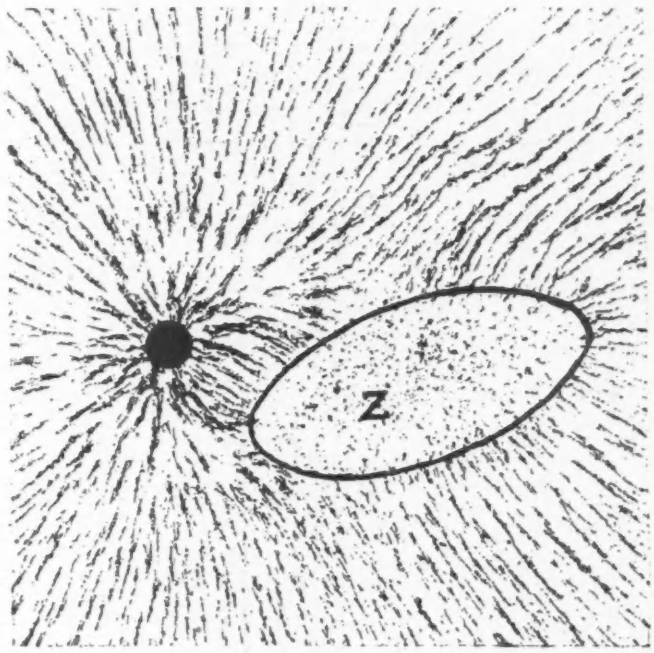


FIGURE 4-5

Magnetic lines of force in the vicinity of a magnetic pole placed near a piece of iron.

ments proceed. As the current I and the distances between electrodes are known and constant, the measurement of V can be translated directly in terms of specific resistance.

Equation (4-3) has been derived with the following assumptions:

1. The ground is homogeneous and isotropic.
2. Electrode C is far from the surface.
3. Electrode C is spherical.

If these conditions are fulfilled, the method described gives the specific resistance ρ of the ground. In practice, however, the ground is not homogeneous. If it were, there would be no need for logging it. The first assumption postulated is therefore never fulfilled. Therefore, the numerical value of the second member of the equation (4-3) does not, in general, equal the resistivity of the formation situated opposite the logging electrodes.

In a few particular cases, however, a good approximation of the average resistivity ρ of the material surrounding the logging device can be had from the application of formula (4-3). This result obtains when all the following conditions are simultaneously fulfilled:

1. The bed thickness is six times at least the length CP, and the electrodes C, P_1 and P_2 are near the center of the bed.
2. The ratio ρ/ρ_m is less than 50, (ρ_m being the specific resistance of the mud).
3. The specific resistance ρ of the bed is nearly uniform throughout.
4. The ground is isotropic.
5. The distance CP is at least ten times the diameter of the hole.
6. The distance of electrode C from the surface is at least five times the distance CP.
7. The electrodes have a roughly spherical or cylindrical shape, their largest dimension being less than 1/20 the distance CP.

Unfortunately, in practice there will be only very few instances where these conditions are simultaneously fulfilled. Therefore the determination of the specific resistance of the formations traversed by a bore hole cannot, in general, be obtained by a direct application of equation (4-3).

Effect of Heterogeneities. If there is a foreign body Z in the vicinity of a current electrode C, the current does not flow any longer in straight paths as it would do in a homogeneous medium. If Z denotes a non-conducting or a poorly conducting body, the current cannot penetrate it, and therefore flows around it in medium M_1 as shown by the solid lines of Figure 4-3. This behavior is often described by saying that the current lines are repulsed by a non-conductor, although there is actually no real repulsion. The equipotential surfaces — which are always perpendicular to the current lines in isotropic media — are also distorted both in the body Z and in the medium M_1. They are shown schematically as dash lines on the figure. The potential distribution being different from what it is in homogeneous ground, the potential difference between the two-pick-up points P_1 and P_2 will evidently be changed by the presence of the nearby body Z.

If the foreign body Z is a better conductor than the surrounding medium M_1, the current, which always seeks the path of least resistance, will crowd it abnormally as shown on Figure 4-4. The current is said to be attracted by good conductors. The equipotential surfaces are also distorted and the voltage drop between points P_1 and P_2 is different from what it would be in a homogeneous medium.

To illustrate with actual examples the distortion of the current lines caused by a good conductor, it is convenient to take advantage of the magnetic analogy mentioned previously. Figure 4-5 shows an actual pattern of the magnetic analogue of Figure 4-4. The pattern was obtained by sprinkling iron fillings on a sheet of sensitized paper below which a magnetic pole and a piece of material Z of high magnetic permeability were placed. It can be seen that the distortion of the magnetic lines of force is quite similar to that of the electric lines of current of Figure 4-4. A direct printing of an electrodynamic pattern is extremely difficult to obtain, which explains why magnetic lines of force have been used for an actual illustration of the phenomenon.

Apparent Resistivity. If it is assumed that electrodes C, P_1 and P_2 are of small size compared with the electrode separations, and if there is measured in a non-homogeneous medium the voltage drop V between electrodes P_1 and P_2 with the arrangement shown on Figure 4-1, there can be computed an expression.

$$\rho' = \frac{4\pi V}{I} \times \frac{CP_1 \times CP_2}{P_1 P_2} \qquad (4\text{-}4)$$

at each measuring station. This quantity ρ' is called the "apparent resistivity" of the formation situated at the level of electrodes P_1P_2, and it is the value given on the electric log. The apparent resistivity can be considered as being equal to the resistivity of a hypothetical homogeneous medium which would give the same potential difference between P_1P_2 when an identical electrode arrangement and the same current intensity is used for the measurement.

If there is plotted a log L′ representing the numerical value of ρ' in terms of the depth of the electrode carrier M and if it is compared with a plot L of the true formation resistivity profile drawn at the same scales, L′ is a distorted image of L. By trying to match the two curves, the best overall match is obtained when the values of ρ' are plotted at the level of point P, midpoint between P_1 and P_2. In thin beds, or in the center of very thick homogeneous

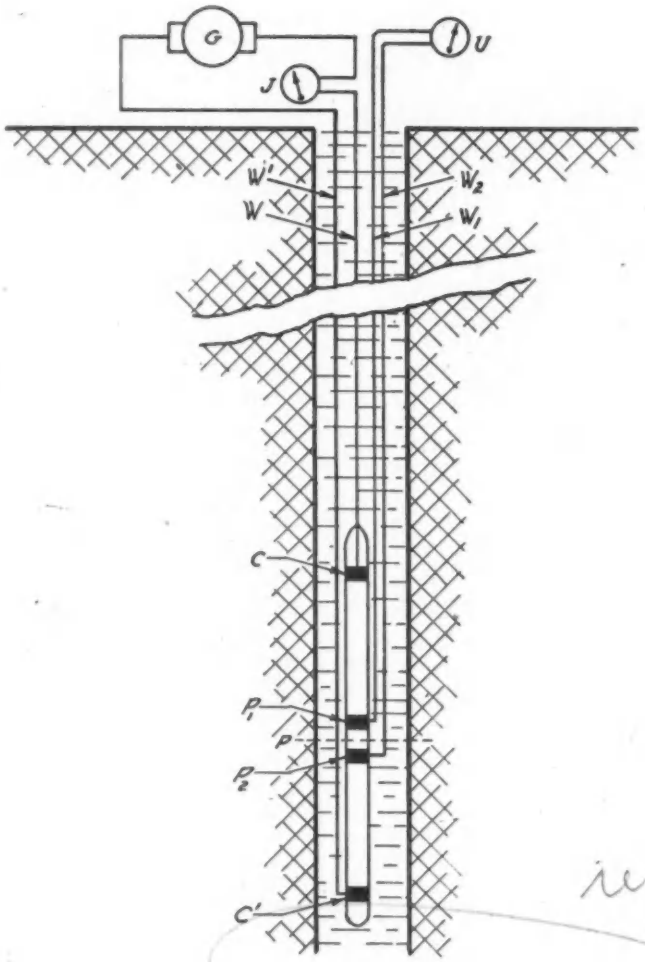


FIGURE 4-6

Electrode and circuit arrangement for the three-electrode method (inverted type).

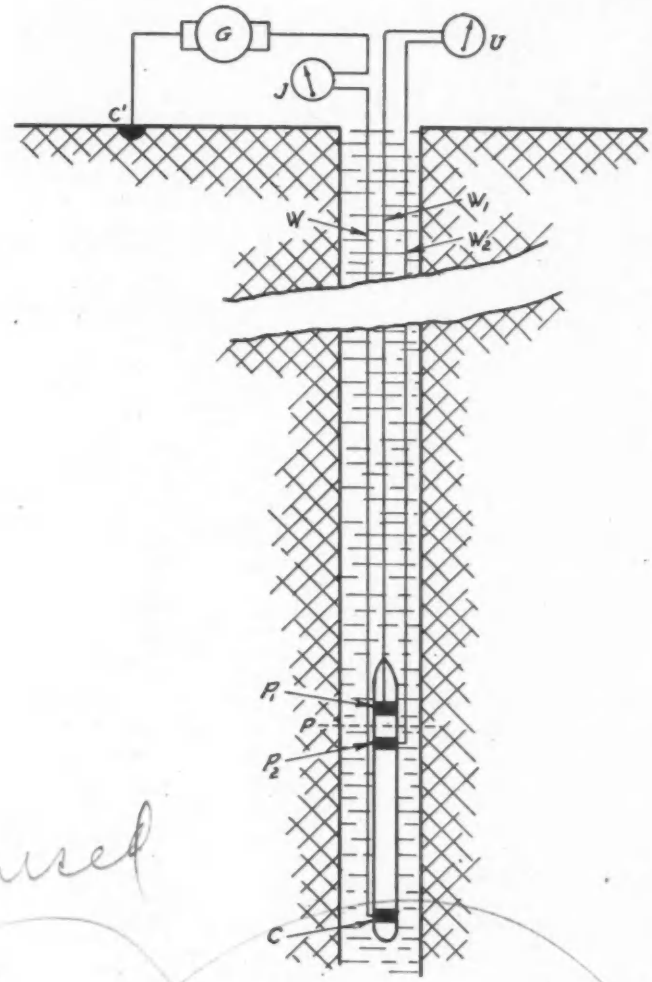


FIGURE 4-7

Electrode and circuit arrangement for the four-electrode method.

beds, the match is qualitatively good. Elsewhere, the match is in general, much less satisfactory. There is always, however, a similar trend between the two curves; when ρ is approximately constant over long sections, ρ' is also aproximately constant. When ρ changes, ρ' changes also, although not always in the same direction. This parallelism indicates:

1. There must be some relation between ρ' and ρ—in fact, it will be seen later that an analytical relation does exist between these two quantities.
2. The log should actually be plotted at point P, mid-point between potential electrodes P_1P_2.

Standard Arrangement. If the electrode configuration used is that shown on Figure 4-1, then the potential electrodes are below the current electrode, and it is possible to get the electric log almost to the very bottom of the hole. Because of this important feature, this arrangement is used whenever possible, and it is called the "standard three-electrode arrangement."

Inverted Arrangement. The three-electrode arrangement discussed above has a few limitations, the most important being that it does not give a log immediately below the casing. In fact, when electrode C is in the casing, the current distribution in the ground is modified considerably and the apparent resisitivity can no longer be computed for equation (4-4). A new equation taking into account the dimensions of the casing should be used instead, which is, however never done in practice. When a log is desired immediately below the casing, it is simpler to use an arrangement where the potential electrodes are placed above the current electrode. This configuration, which is illustrated on Figure 4-6, is called the "inverted three-electrode arrangement." The circuit arrangement and the field operations of the inverted arrangement are identical to those of the standard one.

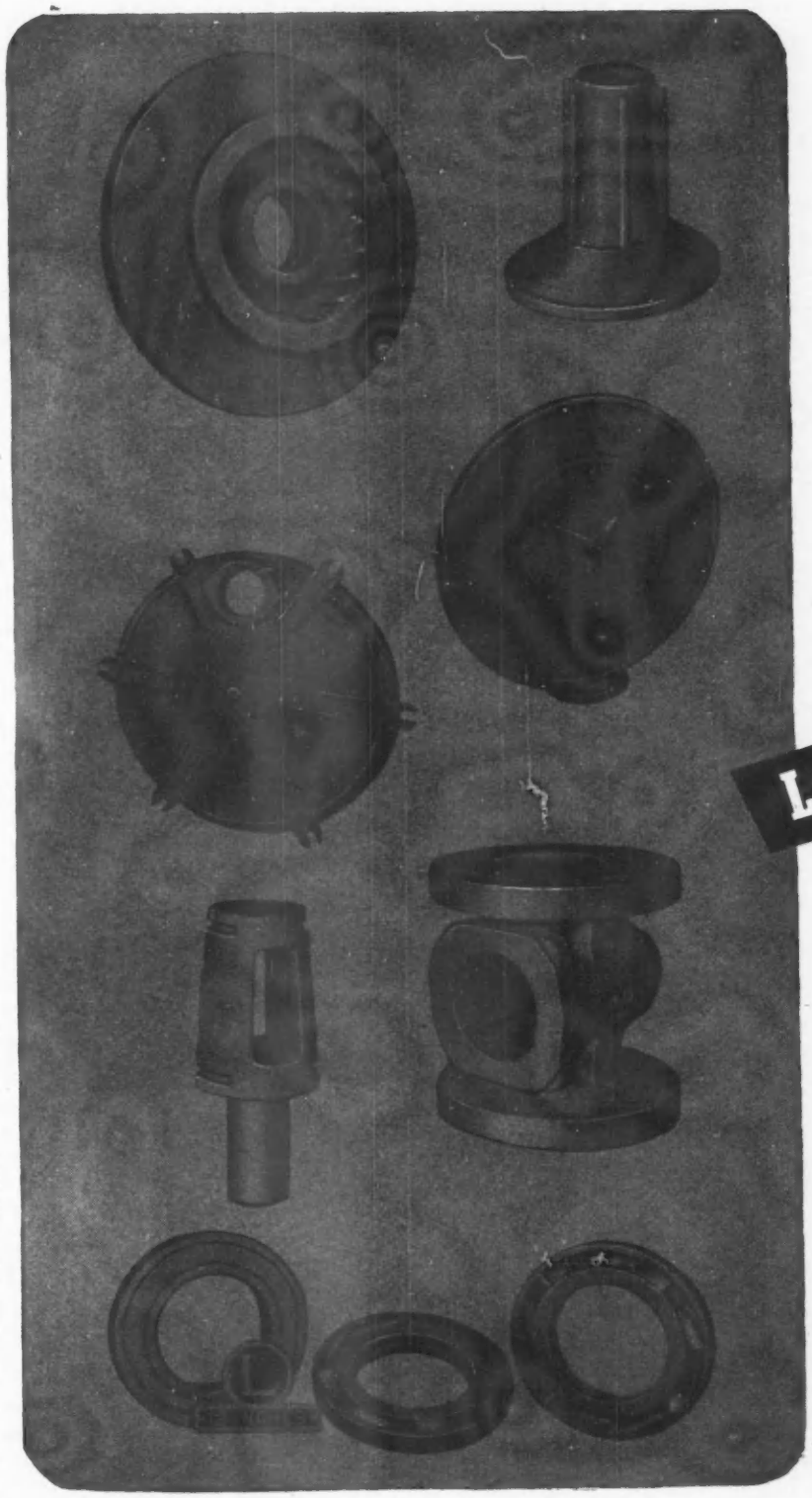
The computation of the apparent resistivity given by an inverted arrangement is also made with equation (4-4). In general, the apparent resistivity log thus obtained is different from that given by a standard arrangement, as will be shown later. This log also is plotted at P, midpoint between P_1 and P_2.

Four-Electrode Method

It has been pointed out before that each electrode configuration has its advantages and its limitations. One might therefore wonder if it would not be possible, by rearranging the electrodes of certain configurations, to combine the advantages of certain arrangements. The new arrangement thus obtained would, of course, have certain limitations also, but they might be without great importance for certain problems. A typical example of this principle is the four-electrode method. Basically this method consists in combining, in one log, the curves given by the 2 three-electrode arrangements just described. The resulting electrode and circuit arrangement is illustrated schematically on Figure 4-7.

This arrangement consists of four electrodes, all being in the bore hole. The current electrodes C and C′ are usually spaced a relatively large distance from each other — 20 feet or more — and the potential electrodes P_1P_2 are placed between C and C′ and are symmetrically arranged with respect to these latter electrodes. Electrodes C and C′ are respectively connected to the two poles of a current source G by means of conductors W and W′, while electrodes P_1 and P_2 are connected to a voltmeter V by means of wires W_1 and W_2. G and U are, in general, located at the surface.

By virtue of the principle of superposition, the potential difference V between P_1 and P_2 equals the potential difference ΔV due to current electrode C, plus the potential difference $\Delta V'$ due to electrode C′. If the ground is isotropic and homogeneous, it is clear that according to equation (4-2) V equals



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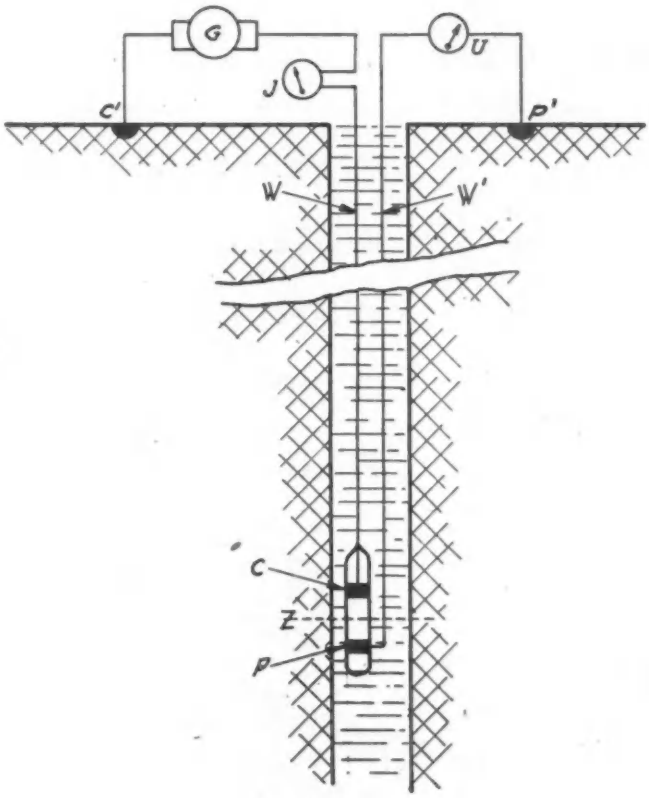

FIGURE 4-8

Electrode and circuit arrangement for the two-electrode method

$$V = \Delta V + \Delta V' = \frac{\rho I}{4\pi}\left(\frac{1}{CP_1} - \frac{1}{CP_2}\right) + \frac{\rho I}{4\pi}\left(\frac{1}{C'P_2} - \frac{1}{C'P_1}\right)$$

As the electrodes are systematically arranged, there results

$C'P_2 = CP_1$ and $C'P_1 = CP_2$

Hence

$$V = \frac{\rho I}{2\pi}\left(\frac{1}{CP_1} - \frac{1}{CP_2}\right) = \frac{\rho I}{2\pi} \times \frac{P_1P_2}{CP_1 \times CP_2}$$

By rearranging the above equation, the following expression for the resistivity of the ground results

$$\rho = \frac{2\pi V}{I} \times \frac{CP_1 \times CP_2}{P_1P_2} \qquad (4\text{-}5)$$

where all terms are known or can be measured.

If the ground is not homogeneous, the above equation may not be applied to compute the true resistivity of any particular bed. However, from the experimental values V and I, there can be computed at each measuring station an expression

$$\rho' = \frac{2\pi V}{I} \frac{CP_1 \times CP_2}{P_1P_2} \qquad (4\text{-}6)$$

which is plotted at P, midpoint between P_1 and P_2. This quantity ρ' is the "apparent resistivity" and is the value shown on the electric log.

The four-electrode configuration, which is a readaptation of the three-electrode arrangement, should be classified among the three-electrode methods.

The Two-Electrode Method

Because of certain limitations of the preceding electrode configurations, another apparent resistivity method is used in many cases. Basically this method comprises two active electrodes C and P situated in the bore hole, hence its name, two-electrode method. Referring to Figure 4-8, C is a current electrode and P a potential measuring electrode. The distance CP, which is called the electrode spacing, is, in general, relatively small, for reasons which will be explained later. The other two electrodes C' and P' are kept far from CP, and are usually located at the surface. The circuit for a two-electrode arrangement is shown schematically on Figure 4-8 which is self explanatory.

It is seen that in a homogeneous and isotropic ground of resistivity ρ the potential difference V between two points P and P' caused by a current I flowing from an electrode C, is given by equation (4-2), which can be rewritten as follows:

$$V = \frac{\rho I}{4\pi}\left(\frac{1}{CP} - \frac{1}{CP'}\right)$$

With the two electrode arrangement shown on Figure (4-8), $\frac{1}{CP'}$ is for all practical purposes equal to zero, and the expression for the potential difference V reduces to

$$V = \frac{\rho I}{4\pi \times CP} \qquad (4\text{-}7)$$

from which can be deduced, as before for the other methods, the following expression for the apparent resistivity ρ' when the ground is not homogeneous:

$$\rho' = \frac{4\pi V}{I} \times CP$$

Experimental as well as analytical data show that the best match between the apparent resistivity and the true resistivity of the formations is obtained when the quantity ρ' is plotted opposite point Z, midpoint between C and P, and this is what is done in practice.

A clear and illustrative justification of this manner of plotting the log is difficult to offer. However, when one remembers that the largest resistance changes, and therefore the largest potential drops, are caused by the materials immediately surrounding current

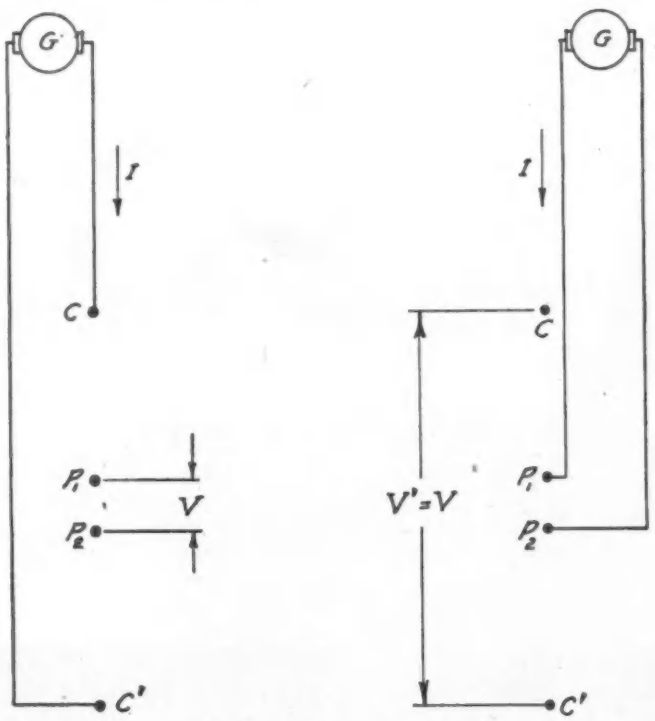

FIGURE 4-9

The reciprocity principle.

LUCEY SLIM-HOLE DRILLING OUTFITS

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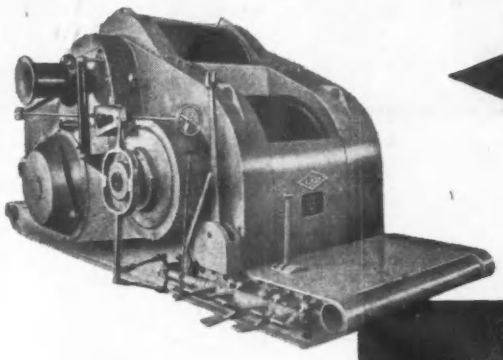

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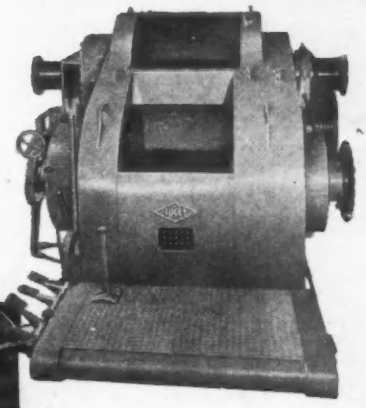

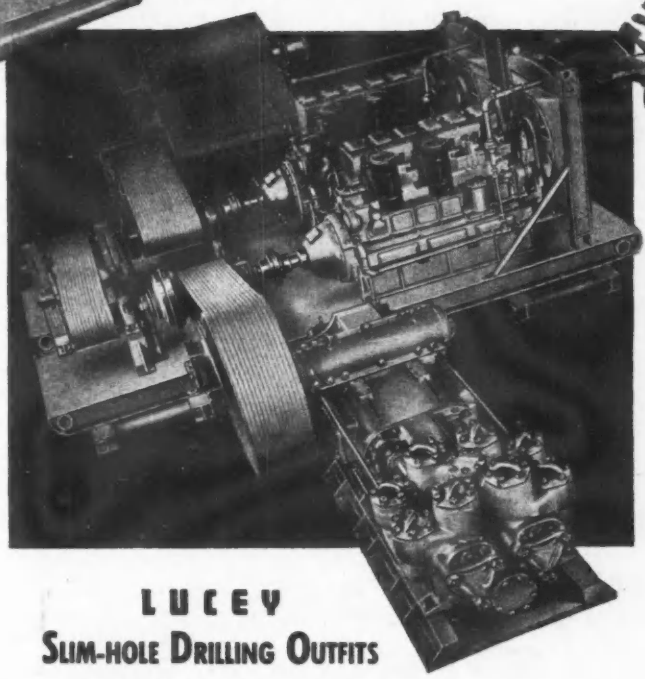

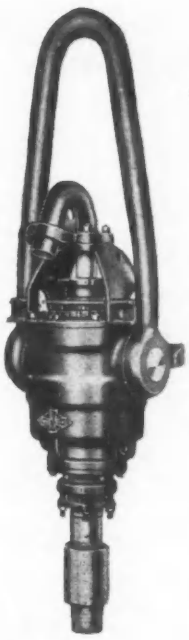

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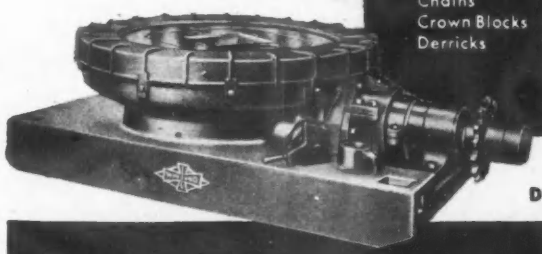

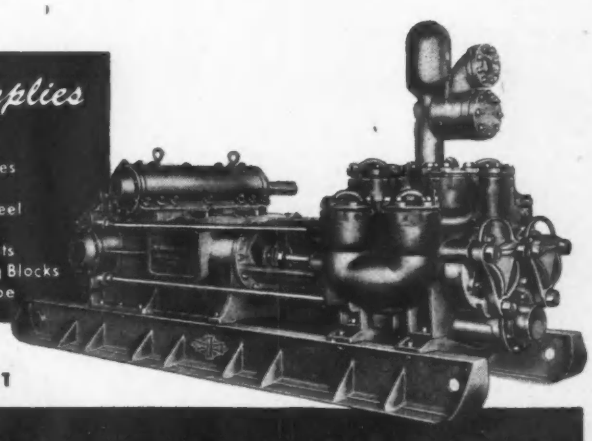

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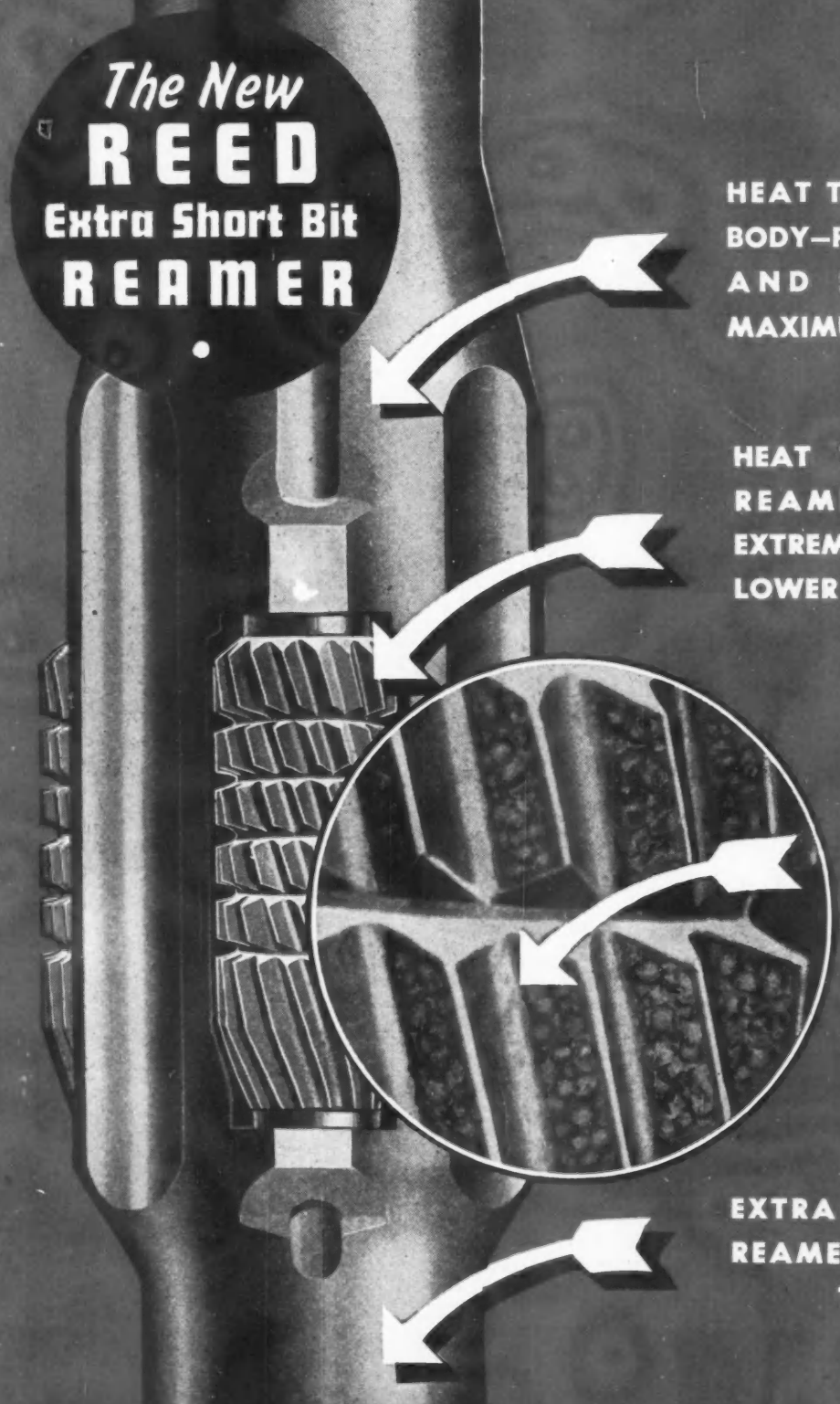

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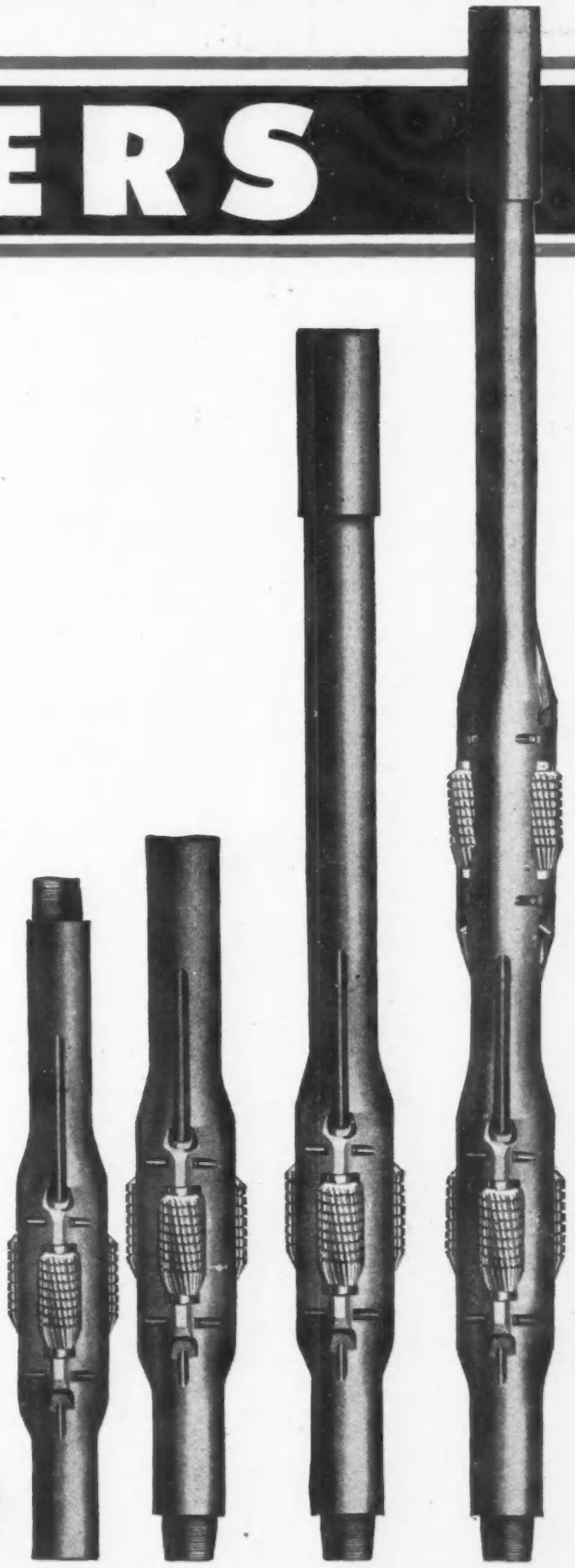

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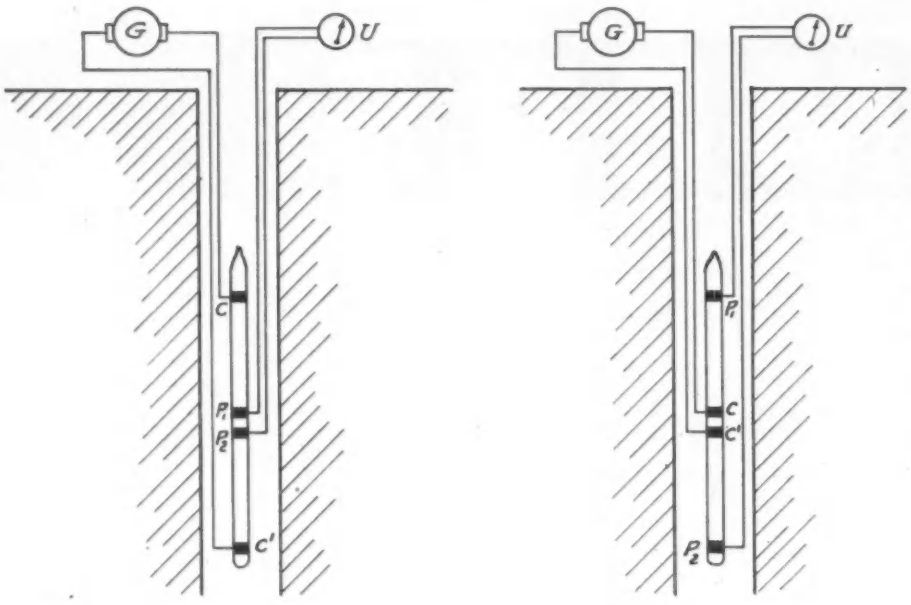


FIGURE 4-10
Application of the reciprocity principle to the four-electrode arrangement

electrode C, (discussed in detail in a preceding article dealing with the single-point resistance method), it will be clear that the potential V expressed by equation (4-7) will be controlled mainly by nature of the ground comprised between electrodes C and P. Hence, the method of plotting the apparent resistivity given by the two-electrode method.

Reciprocity Principle

Before analyzing in detail the apparent resistivity curves given by preceding methods, it is necessary to call attention to an important theorem. (For a discussion of this theorem the reader is referred to "The Four-Terminal Conductor and The Thomson Bridge" by Frank Wenner, Bureau of Standards Vol. 8, 1912, pp. 559-610. The following paragraph is copiously quoted from Wenner's article).

"In any conductor or system of conductors having four terimnals A, B, C and D selected in any way, the drop in potential V_{AB}^{CD} from A to B caused by a current entering at C and leaving at D is equal to the drop in potential V_{CD}^{AB} from C to D caused by an equal current entering at A and leaving at B". In other words $V_{CD}^{AB} = V_{AB}^{CD}$

This theorem applies regardless of the shape of the conductor and the resistivity distribution. It is valid for alternating as well as for direct current.

An important application of this theorem to well logging will be discussed. Suppose that the four-electrode arrangement previously described is being used. This has been redrawn on the left hand side of Figure 4-9 for convenience. Suppose also that at a certain measuring station the current intensity in the current circuit CGC' is I and the resulting potential difference between P_1 and P_2 is V. Now, at the same station, suppose electrodes P_1 and P_2 are used as current electrodes — see right hand side of figure — and that the current intensity in the current circuit P_1GP_2 is I, the same intensity as that used previously on the arrangement shown at left. By virtue of the reciprocity principle, the corresponding potential difference V' between electrodes C and C' will be equal to V, regardless of the resistivity distribution in the ground. This result, which is surprising at first, is well known in electrical engineering.

From the foregoing discussion, it is clear that the 2 four-electrode configurations shown, for instance, on Figure 4-10 will give identical electrical logs. The arrangement shown at left, (No. 1), is called the "normal" arrangement, whereas that shown at right, (No. 2), is the "reverse" arrangement. By four-electrode configuration, reference is either to the normal, or to the reverse arrangement, unless specifically mentioned otherwise.

The reciprocity theorem applies, of course, to all electrode arrangements consisting of four electrodes. In particular, the 2 two-electrode arrangements shown on Figure 4-11 will give identical apparent resistivity logs, and will therefore be considered as being identical.

Because of the flexibility it confers to the design of the equipment, the reciprocity principle is often taken advantage of for actual logging operations.

Classification of Resistivities

In order to avoid confusion it is well to define clearly the several kinds of resistivities which will be considered in forthcoming articles.

True Resistivity. This is the resistivity as defined in electrical engineering textbooks, namely the resistance of a body of the substance of unit cross-section and of unit length. This is the property which well logging attempts to measure.

Apparent Resistivity. It is not possible, in general, to measure, by present well logging methods, the true resistivity of the beds traversed by a drill hole. Actual measurements give what is called the "apparent resistivity," which is usually different from the true resistivity. Both true and apparent resistivities are commonly expressed in ohm-meters.

Relative Resistivity. For theoretical and laboratory studies, it is convenient to use the "relative resistivity," which is the ratio of the resistivity of the object bed to the true resistivity of another bed used as a reference. There are, of course, two kinds of relative resistivities: the true relative resistivity, and the apparent relative resistivity. Relative resistivities are dimensionless and are, therefore, expressed by a number.

Maximum Resistivity. The apparent resistivity of a bed varies from the top to the bottom of the bed. Often, in practice, only the maximum value is considered because it is usually the only value which stands out on the log. This "maximum apparent resistivity" is also expressed in ohm-m.

Average Resistivity. The average resistivity of a section is, by definition, the number obtained by dividing the area below the curve by the length of the section. There can be, of course, an average true resistivity and an average apparent resistivity. Both are expressed in ohm-m.

(To be continued)

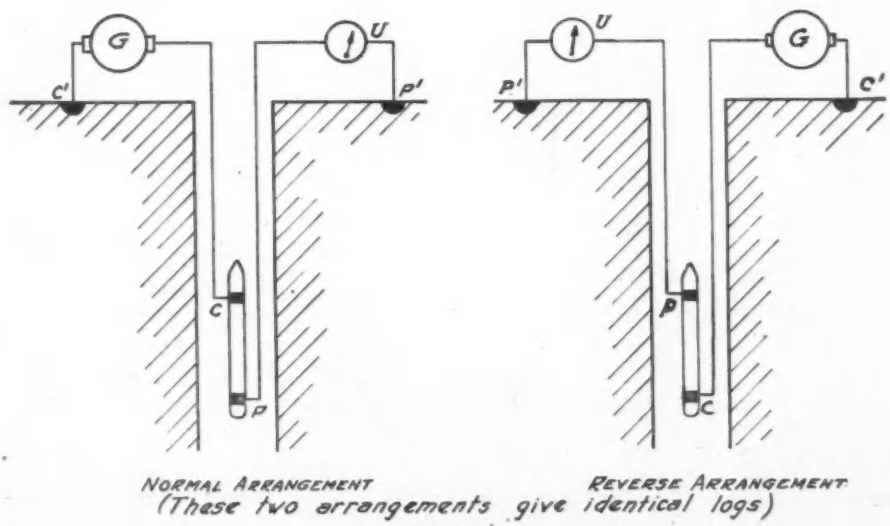
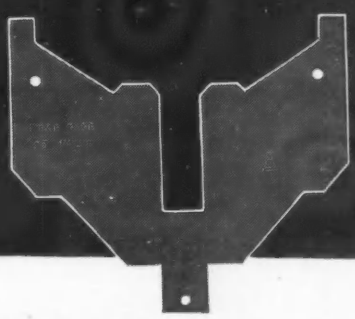


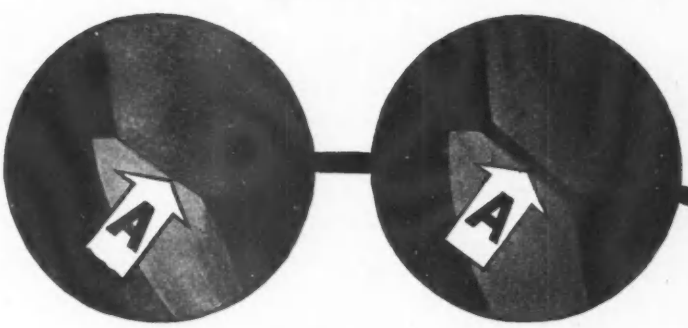
FIGURE 4-11
Application of the reciprocity principle to the two-electrode arrangement

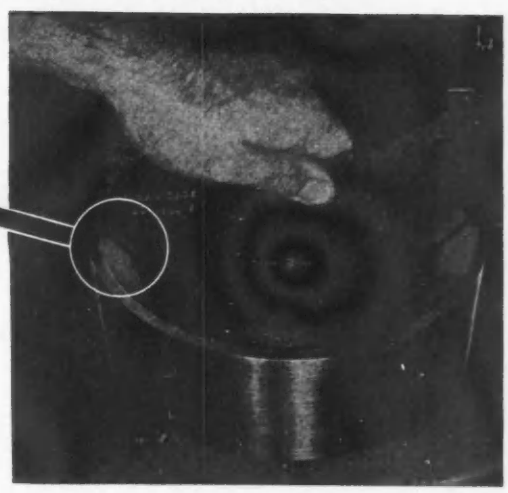
HOW TO DOUBLE THE LIFE OF YOUR MISSION SLUSH PUMP VALVES

USE THIS "FREE" WEAR GAGE
Its use enables the operator to get the most satisfactory service from his Mission Valves



CHECKING THE VALVE SEAT FOR BUSHING WEAR





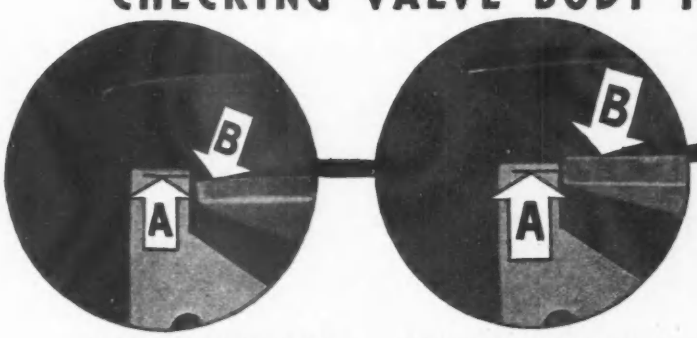
TIME TO CHANGE BUSHING

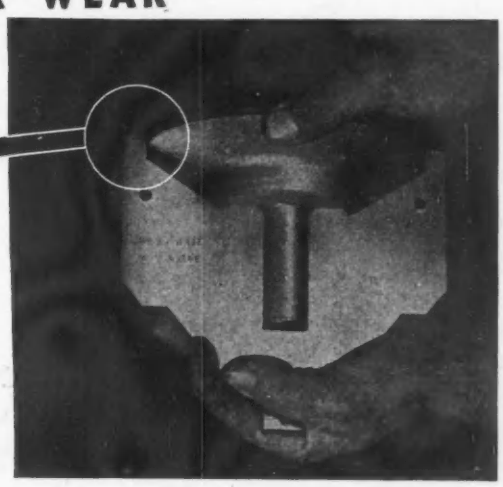
When the bushing is worn and needs changing, the wear gage touches the sealing surface of the valve seat as shown at (A).

NEW BUSHING INSTALLED

Notice how the wear gage stands away from the sealing surface of the valve seat when the bushing is in good condition. This means long, trouble-free service ahead.

CHECKING VALVE BODY FOR WEAR





GAGING A WORN BODY

When the body is worn and needs changing, the line on the wear gage (A) is above the surface of the valve body (B) as shown.

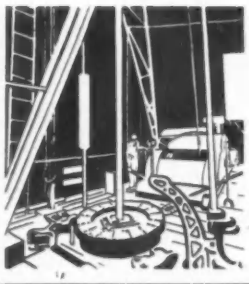
HOW GAGE APPEARS ON A NEW BODY

Notice how the line (A) is well below the surface of the body (B). Prompt changing of worn valve bodies results in long insert life and greatest freedom from valve troubles.

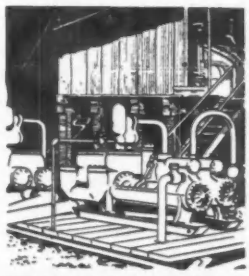
WRITE US FOR THIS "FREE" wear gage . . . or request it through your supply store . . . Use it to double the life of your Mission valves by changing the wear-taking bushing at the proper times.

Mission
MANUFACTURING CO.
HUMBLE ROAD HOUSTON, TEXAS

4A-15



OPERATING HINTS *For Drilling Crews*



Discarded Pump Units Make Handy Bar Extensions

IMPROVISED HAND TOOLS

For the many small jobs on the derrick floor requiring use of a pinchbar or crowbar, light but very strong tools may be made from discarded sections of oil well pump barrels or plungers. With few exceptions the need for such a pry bar is for only a few moments at a time, but the speed with which such lightened tools may be handled materially contributes to easing the load of individual workmen and generally speeds up floor operations.

The light alloy-steel barrels may be employed in two ways. In making up the crowbar, the two solid tips of the ordinary bar are cut off and rewelded to the ends of the hollow tube. As a "snipe," one of the light barrels is exceptionally well suited, supplying the necessary added leverage for breaking out stubborn fittings with hand wrenches, or for augmenting the bar.

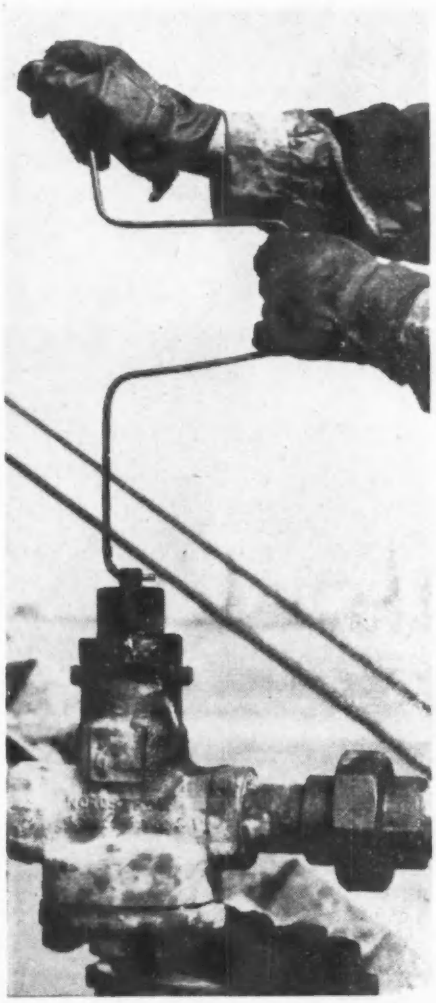
Reclaimed seamless tubing sections form pinchbar body and "cheater" for extending leverage on wrench handles.

Speed-spinner Improves Plug Valve Lubrication

GREASING RIG VALVES

Speeding up mud pump servicing work, one derrick man uses shop-made, brace-like tools with which he can spin grease plugs in or out on plug-type valves. A length of ¼-inch welding wire was bent in the manner shown in the photograph, the lower end being provided with a 1-inch horizontal bend for hooking through the transverse hole in the hexagonal head of the grease retainer cap screw.

Ordinarily consuming several min-



Just a cleverly bent wire, but its use speeds lubrication and saves tedious wrenching of plug.

LOAD BINDERS

5 — Sizes — 5

Take from ¼" to ⅝" Chain

For details see page 810 Composite Catalog

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You can count on Jeffrey Devil Dog oil well chains. Jeffrey is proud of its 65 years experience in chain building. A chain for every drilling service.

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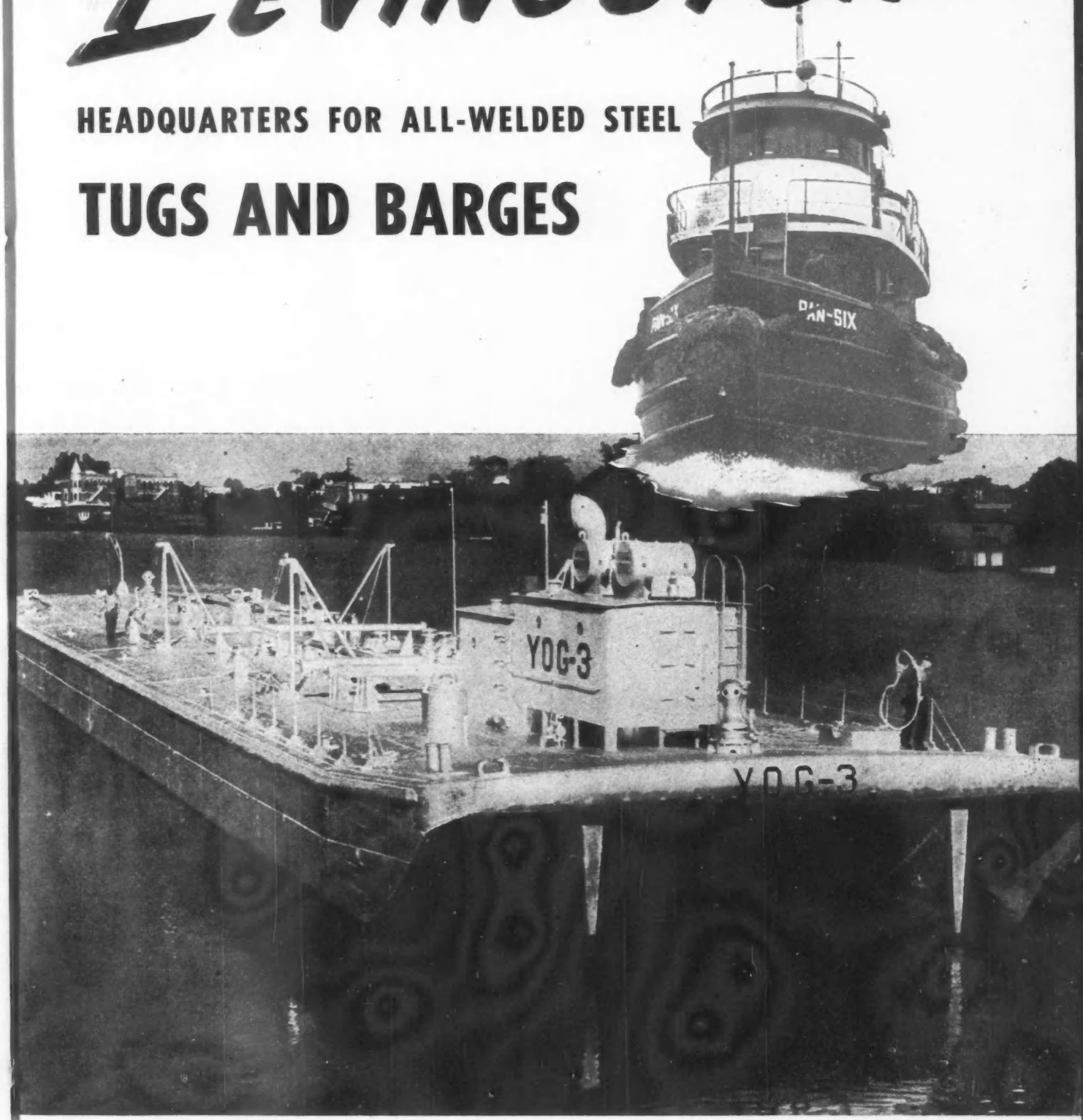
IN HOUSTON: 6358 AUDEN STREET

LEVINGSTON

HEADQUARTERS FOR ALL-WELDED STEEL

TUGS AND BARGES



Many years before the war, Levingston had earned a reputation among oil transportation companies in construction of high-efficiency tugs and dependable barges.

Now, after three years of wartime construction for the Army and the Navy, building rescue tugs, service tugs, tankers, derrick lighters and barges, Levingston has expanded its facilities and has acquired a wealth of additional experience that will be passed along to marine operators in the post-war era.

Look to Levingston for the finest in marine transportation equipment and maintenance!

LEVINGSTON

SHIPBUILDING COMPANY

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THE POSITIVE LEAK PREVENTER

YOU SAVE TIME ALL THE TIME WITH Young DRILLING ENGINES

Because of their unit construction and skid base mounting, you can move a YOUNG Drilling Engine with minimum trouble and do it quickly. When you get it on location, those same advantages help speed your set-up. No elaborate foundation is required. From then on your savings in time begin to pile up. No gears to shift—instant reverse with a single movement of the control lever. Brake sets automatically when clutch is disengaged. Ample power for fast pulling-out. On jobs where time is money, the time you save every day with a YOUNG Drilling Engine really counts.

YOUNG ENGINES MAKE YOUR DRILLING DOLLARS GO DEEPER

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Iverson Tool Co., Texas, Artesia, New Mexico
Branchland Pipe & Supply Co., Huntington, W. Va.
Connelly Machy. Co., Billings & Great Falls, Mont.

OTHER YOUNG PRODUCTS
Natural Gas Carburetors • Orifice Gas Well Testers
Under-Road Boring Machines • Electric Light Plants

utes' work when using a small wrench, this improved method requires only a few seconds to spin out the screw, insert the lubricant plug and re-run the screw. With the dozen or so high pressure valves that must be serviced frequently on a deep well rig, this gain in time adds up to a substantial saving.

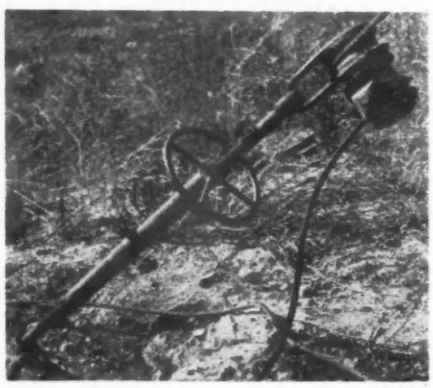
Improved Guy Hitch Aids Plumbing Mast Derricks

Speeding up work connected with raising and plumbing the mast on small portable drilling rigs, one company uses specially-made, hand-operated turnbuckles with which to tighten guy lines.

RIGGING UP MAST UNITS

Heavier and more easily operated, the body of the turnbuckle is equipped with a hand wheel made of welded sucker rod material. The reverse-turn hook at the lower end of the unit is provided with a positive acting lock which eliminates any possibility of its slipping off the loop attached to the buried deadman.

The perforated cleat easily drops in place over the open end of the hook and is secured with a heavy cotter pin. The upper, or line end, of the turnbuckle has welded to it a small drum around which the wire is wrapped several times and securely locked in place with a handy



Taking slack on drum, then spinning hand wheel to operate turnbuckle, speeds guy adjustment.

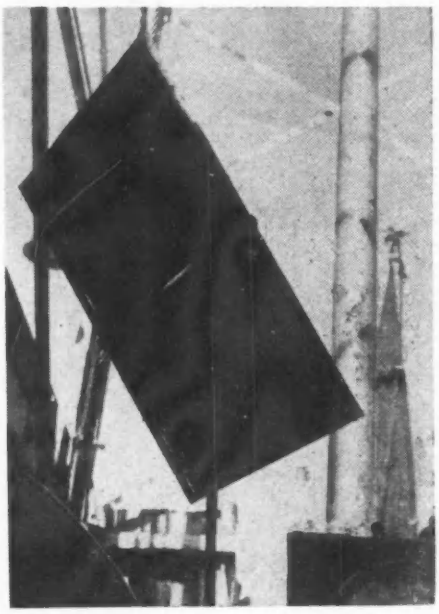
bolt-operated cable clamp. The strain imposed on the drum is made to fall between the sucker-rod forks to which the take-up drum is welded, thus creating a straight-line pull. Savings brought about through the ease with which guy lines may now be installed have been materially increased.

Swivelled Sun Shield Protects Drilling Stand

A handy, adjustable shelter that serves a number of useful purposes for the driller may be built up in a few minutes time out of easily-obtained materials. To the edges of a piece of flat sheet iron

WORKING SHELTERS

approximately 24 by 36 inches were welded lengths of ½-inch pipe to serve as stiffeners. Across the center of the lower side of the sheet also was welded another length of pipe, the latter being ¾-inch and having a tee in the line several inches from the end. An upright length of ¾-inch pipe which slides down



Reinforced light tank sheet, supported on pipe member, is carried on pipe standard for quick setting.

inside another of next largest size serves as a stand whose height can be regulated to suit the need of the driller, the upright being fixed by a large set-screw located at the top of the lower section of pipe. The whole is mounted on a broad flat base which is set just to the left of the driller between the brake handle and the drawworks drum.

In operation, the covering device may be turned or slanted to any angle to provide shelter for the driller. Because the upright pipe is attached to the tee at a point off center, a wide degree of coverage may be gained. It may be used as a sunshade to better enable the driller to see up in the derrick when coming out of the hole, or it may be utilized for a rain shield. It also is of value when breaking out a "wet" string, when oil, water and mud may spray down from above.

GOOD well control equipment, proven well completion methods, and seasoned operators to assist you. If you're looking for this combination . . . we have it.

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BROWN OIL TOOLS, INC.
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Why...you find the "Recalibrator" in the gauge that needs it least—

It would be a wonderful thing if someone would devise a pressure gauge that could take abuse and still remain absolutely accurate.

But every operating man knows that such a gauge has never been made. A sudden surge of over-pressure or some other unexpected shock will knock the best gauge made off the beam. Of course such shocks should be avoided, but unfortunately they just can't be eliminated even in the best regulated plants.

So even the finest gauge of them all — even the Marsh Mastergauge, for example — may at sometime go out of adjustment. What then?

Well . . . if it were the conventional type of gauge you would have to laboriously remove the pointer, glass ring and dial, and reset the movement adjustment. But when a Marsh Gauge is out of adjustment it's only a passing incident. You simply turn the "Recalibrator" screw until the pointer goes to the zero mark, and this can be done in less time than it takes to tell it.

The "Recalibrator" is not only the *handy* way to correct the error; it's also the *best* way. Practically all errors in gauges are caused by distortion of the bourdon tube. This distortion produces an incorrect relation between the tip of the tube and the movement. When you reset the pointer, you don't correct this relationship; you simply compensate for it. As a result the gauge may be corrected at the zero point but be incorrect at certain other points on the dial.

The "Recalibrator" actually re-establishes the relation of the tube to the movement. Therefore it actually *does* "re-calibrate" the gauge.

When you stop to think it over, it's perfectly logical that the "Recalibrator" should be found on the gauge that needs it least. The manufacturer who takes the most pains to build a gauge that *is* accurate would naturally be the manufacturer to provide the best means of *keeping* it accurate!

NEW BRANCH ASSEMBLY AND REPAIR PLANT AT

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To meet the ever-increasing demand for Marsh equipment and service in the oil country we have opened a branch assembly and repair plant at Houston, Texas. The facilities of this plant will not only expedite the handling of your requirements; it also enables us to render a complete engineering service and provides ideal facilities for servicing and repairing all makes of gauges.

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DIAL THERMOMETERS HEATING SPECIALTIES

Pipe Line Review

Lockhart-East Chicago Pipe Line in Operation

The Texas Pipe Line Company's 34 miles of 6-inch petroleum products lines from Lockhart, Illinois, to East Chicago, Indiana, has been completed and put on stream. Morrison Construction Company was the contractor.

Willamar Field Pipe Line Opened by Pan-American

Pan-American Pipe Line Company has put into operation a 34-mile 8-inch welded pipe line from the Willamar Field in Willacy County, Texas, to the tanker terminal at Port Isabel, Texas.

This line will have an initial capacity of 10,000 barrels per day which can be increased to handle the estimated peak producing capacity of the field as additional wells are put on stream. There are 4 field stations gathering from a present productive area 3 miles wide and 5 miles long. J. W. France & Company of Corpus Christi was the contractor.

Preferential Employment For Servicemen Planned

Employes of Carter Oil Company and Oklahoma Pipe Line Company, who have been granted leaves of absence to serve in the armed forces, will receive special consideration for vocational rehabilitation when they return to their jobs, the managements announced in Tulsa.

The ex-serviceman's training and experience while away from the company will be considered in an effort to provide preferential employment commensurate with his abilities, thereby enabling him to be assigned to a better job than the one he left, provided he can qualify and the job is available. After being assigned to a job, the returning employe will be paid travel time and expenses from Tulsa to the place of his employment. If the employe is physically unable to return to work after discharge from the armed forces, he will receive sickness benefits provided by the company.

Returns to Company

After nine months with the Petroleum Administration for War, Fred H. Warren returned August 1 to the Ohio Oil Company in Findlay, Ohio, as general superintendent of the trunk and gathering lines east of the Mississippi River, pipe line department.

During his leave of absence from The Ohio Oil Company, Warren served in the pipe line engineering section of the supply and transportation division of PAW, primarily in a consulting capacity. Prior to leaving for Washington, he was assistant chief engineer in the pipe line department of The Ohio Oil Company.

100 Drilling Units Busy In West Edmond Field

With virtually every Oklahoma drilling contractor represented in the West Edmond development and others coming in from Texas, Arkansas, Louisiana, Montana, Michigan, Illinois, Colorado and Indiana, the field is reported to have more than 100 drilling units turning. Supply houses, recognizing that the development may become Oklahoma's leading producing area before the end of the year, are establishing branches in and around the field.

Kerlyn Oil Company is operating 14 units in the field which has extended into Canadian, Logan and Oklahoma counties, with wells now drilling in adjoining Kingfisher County, which may be linked with the pool soon.

As soon as present contracts are completed, 10 additional rigs owned by Sohio Petroleum Company and Barnsdall Oil Company and purchased from Fain Drilling Company, are expected to move into West Edmond. Champlin Refining Company has five rigs running, as has J. E. Trigg. Big Chief Drilling Company and Warren-Bradshaw has 4 each and Vierson & Cochran and Denver Producing & Refining Company, three each.

Contractors scheduled to move in heavy-duty tools include Jack Grace, D. Norwood, Jennings Drilling Company, all of Wichita Falls; Falcon-Seaboard of Tulsa, Beacon Drilling Company of Tulsa, and Lupher Drilling Company of Reed City, Michigan. There are 59 contractors represented in the development.

Constitutionality of Crude Tax Questioned

Constitutionality of Mississippi's new crude oil severance tax was questioned in a suit filed August 22 at Jackson, Mississippi by Gulf Refining Company.

Attorneys said the litigation arose from refusal of some royalty owners to accept payments from the oil company minus their prorata share of the tax. Owners advised the company that in deducting the tax from their royalty payments, it was doing so at its "own perils."

The act requires oil companies to collect the tax and to prorate it among all participating groups. Oil companies are liable for the payment to the state.

The suit points out that the tax should be a property or ad valorem tax and not in the form of a severance. Attorneys said that when oil is brought to the surface it becomes a property and therefore subject to such taxes as are levied by the state. The levy is figured at the rate of 6 cents a barrel or 6 percent of the price, whichever is greater.

Drilling Campaign in Southern Chile Planned

Test wells will be drilled as soon as possible in the Magallanes district of extreme southern Chile.

Recent geological and geophysical explorations carried on by United Geophysical Company for the Corporaccion de Fomentos have been confined to the vicinity of Punta Arenas, west of the Strait of Magellan. Explorations will be continued, and the United company will continue to provide technical advice to the Chilean government during the development period ahead. First wildcat tests will be made with both rotary and cable equipment, with deepest tests projected for upwards of 10,000 feet. The drilling program is being held up pending the procurement of equipment from the United States.

Tax Concession to Spur Canadian Wildcatting

A new tax concession to spur wildcat drilling and exploration has been announced by the dominion government of Canada.

Fifty percent of the expenditures on dry holes, including geological and geophysical expenditures, may be deducted from taxes payable under the income tax and excess profits tax acts, it has been ruled. This will apply to wells spudded between June 26, 1944, and March 31, 1945.

Previously, a write-off of 40 percent of dry hole costs from taxable income was permitted, the tax then being computed on the basis of the remaining income. Under the new rule, the tax is determined on taxable income before any deductions for dry holes, and 50 percent of approved expenditures is then deducted from the tax.

The concession is applicable to any "corporation, association, syndicate or exploration partnership whose principal business is production, refining or marketing of petroleum or exploration or drilling for petroleum."

Colombia's Tibu Area Has Ten Producing Wells

There were 10 producing wells in the Tibu area, in Colombia Petroleum Company's Barco concession, as of August 15, including 8 shallow Tertiary wells and 2 deep Cretaceous wells. The Tibu area takes in the former wildcatting areas of Tres Bocas and Socuavo, some 25 or 30 miles northwest of the Petrolia field. The Teritary wells, producing from maximum depth of 5000 feet, are yielding an average of slightly more than 300 barrels daily, through chokes, of 30-31 gravity oil. Only within recent weeks has Tibu oil been transported from the field storage tanks. It is sent by 4-inch pipe line to Petrolia.

Two deep Cretaceous wells have been completed in the Tibu field at depths if 9228 and 9850 feet, as distillate producers having very high gas-oil ratios. Another deep one is rigged up, one shallow Tertiary well is testing, and a second is setting casing. Current production from the Petrolia and Tibu areas is 13,500 barrels daily.

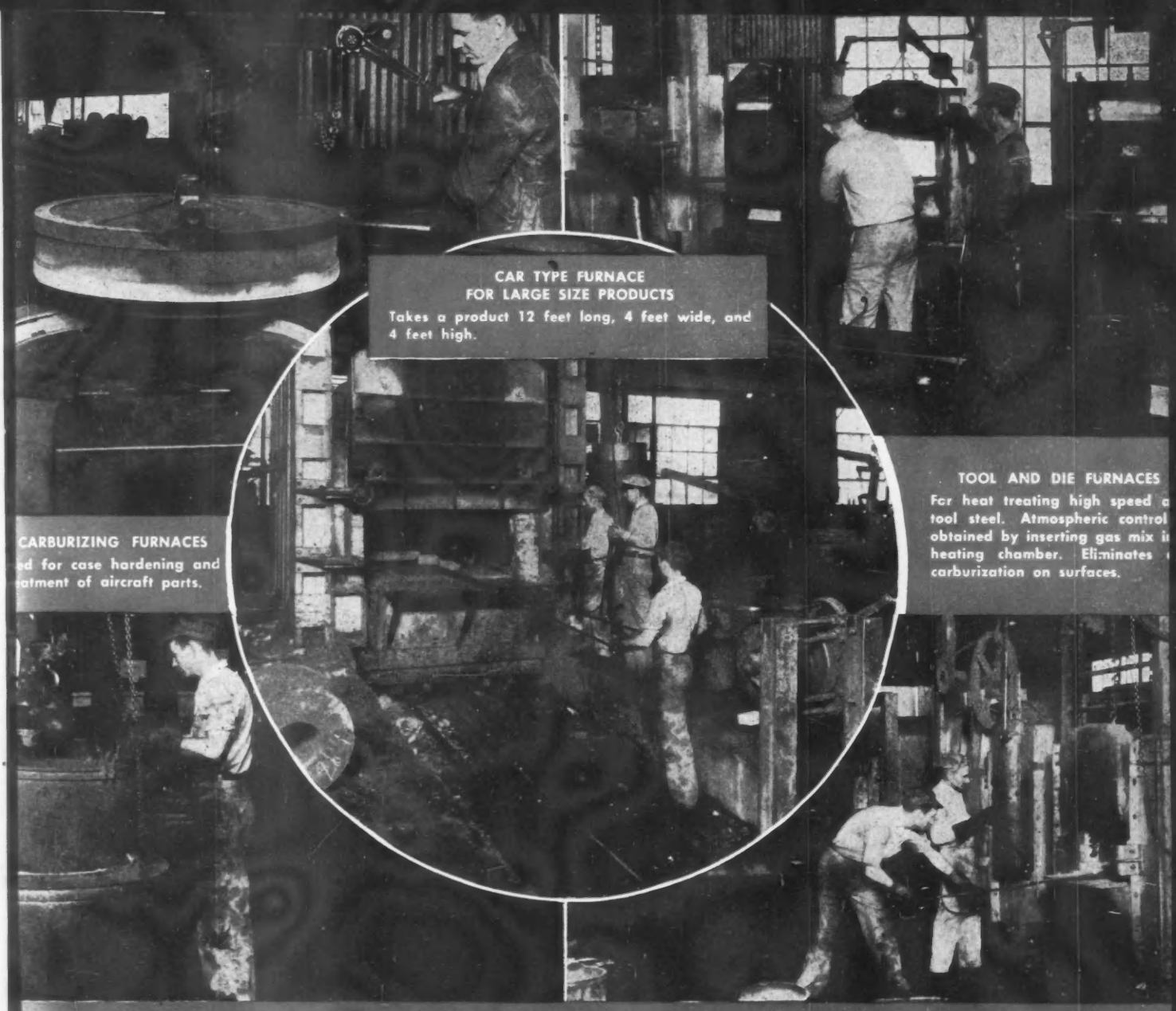
Portuguese East Africa Exploration Is Planned

The government of Portugal has announced that it has granted a concession to a newly-formed British-Portuguese firm to carry out geological and geophysical explorations throughout the entire area of Mozambique, Portuguese East Africa.

Exploitation rights, under a royalty agreement, are also granted the new company known as Manica Trust, Ltd. Mozambique comprises more than 150,000 square miles characterized by grassy plains and open forests that will not hinder exploration. A considerable thickness of Mesozoic and Tertiary rocks occurs in the colony.

Gulf Plans Geophysical Surveys in Nicaragua

Following the recent completion of its stratigraphic test well in Nicaragua to establish fundamental geological control for more detailed surveys of the region, Gulf Exploration Company plans geophysical surveys.



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Takes a product 12 feet long, 4 feet wide, and 4 feet high.

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TOOL AND DIE FURNACES

For heat treating high speed a tool steel. Atmospheric control obtained by inserting gas mix i heating chamber. Eliminates carburization on surfaces.

DRAW FURNACES—CONVECTION TYPE

rature control of this type of furnace makes for uniformity; product being drawn is kept at the same temperature, giving ral uniformity.

A BATTERY OF GAS FIRED FURNACES

Each of Cook's heat treating furnaces is controlled by electric recording thermocouple pyrometers, assuring uniform heat treatment. *Tougher, longer-lasting steel results from this carefully controlled heat treating.*

Cook's Heat Treating to exacting standards . . . finest heat treating equipment . . . skilled and long experienced personnel plus determination to be leaders in all heat treating techniques

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UNIFORM HARDENING . . .

IDENTICAL PHYSICAL CHARACTERISTICS . .

TOUGHER, LONGER LASTING STEEL

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MTI MASTER CRAFTSMEN

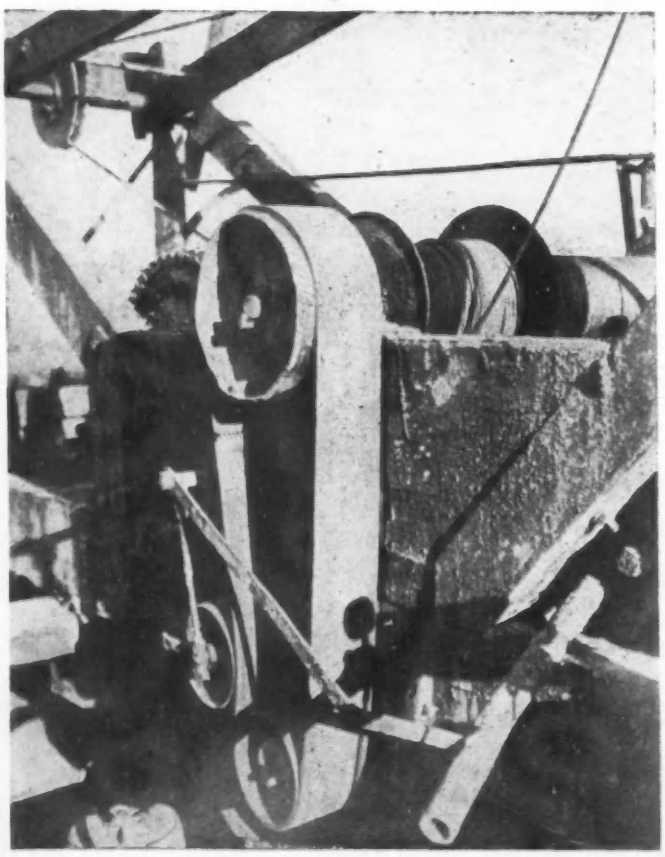
METAL TREATING INSTITUTE

Bailer Pickup Is Speeded By Using Idler As Substitute for the Clutch

TO PROVIDE the snappy, rapid pickup of the dump-bottom bailer so necessary for efficient cleaning-out work on shallow wells, one contractor has developed a wartime, fool-proof clutch arrangement which has greatly speeded up his work in the field. Instead of the conventional clutch, a double pulley and idler arrangement is mounted on the side of the clean-out rig. Separated by approximately 4½ feet, the power pulley, shown near the bottom of the rig frame, is connected by a belt to the larger drive pulley mounted on the sand-line reel shaft. The belt, of heavy leather to stand considerable wear, is left a little slack and the proper tension and therefore proportionate degree of transmission of power is regulated by the small idler located on the back side down near the power pulley.

Permitting an easily-regulated degree of friction with but a short length of travel of the linkage, the sand-line reel can be stopped and started quickly, due largely to the fact that the idler is in contact with the belting at all times. The idler, suspended in position by a vertical arm which is in turn bolted to the side of the rig, is held back in the proper position when not in use by tension of a small coil spring also mounted on the side of the rig. The necessary free movement of the idler control lever is obtained by means of a curved length of flat steel which carries the horizontal motion of the control rod around beneath the power pulley. The control lever situated near the operator at the front of the rig is mounted so that it is in a near-horizontal position, the lever being locked in any position by pressing a button at the top to engage or disengage a toothed segment on a half-circle of steel plate. Releasing this catch and applying a downward motion of the lever causes the idler to press inward on the belt, engaging the reel pulley, while an upward motion frees the pulley, allowing the bailer to fall rapidly. When not in use, the lower power pulley continues to run, but due to the slackness of the belt, little or no wear results.

Heavy leather belting is used on this clutching arrangement, since considerable friction is involved in the operation of lowering and raising the bailer a number of times, the latter procedure insuring efficient and quick functioning of the flapper valve at the bottom of the bailer. Despite the belief that the belting would wear out rapidly, upkeep is small and excellent long-lived service is obtained. As the belt stretches, it is necessary only for the operator to press down his control handle slightly farther each time, and after a long period, depending upon the use, a small section of belting then can be cut out and the belt spliced, after which it is ready for further operation.



With the driver pulley located directly below the unit on the sand-line drum shaft, slack in the belt tends to hang clear, power being applied through the linkage to move the idler in toward the belt center line. Slippage between belt and driver pulley as idler pressure comes on cushions shock to sand line, without reducing time to build up to operating speed.

German Oil Discoveries In Poland Discredited

Recent information, authenticated by London sources, discredits German claims of important oil discoveries in northern Poland, as reported in March of this year. The fields of western Galicia have maintained their previously established production rates, but in spite of all German efforts the output of the eastern Galician field has declined steadily in the past year. From known production of 500,000 metric tons credited to Poland in 1938, the figure had dropped to 350,000 tons for the year 1943, according to expert European estimates.

It has been confirmed that utilization of Polish natural gas for industrial and domestic purposes had been greatly increased, up to the time of the recent advance of Russian armies into the area. The Russians have found extensive new gas pipelines serving a number of industrial points.

Argentina Field Extended

A deep wildcat has been completed successfully southwest of the main Comodoro Rivadavia field, Chubut Territory, Argentina. The pay zone is below the Tordillo zone, and one that may not only be proved for considerable extension acreage but as a new pay within the field proper.

Drilling Area Being Planned in Egyptian Area

Foreign snbsidiaries or affiliates of the Shell-Union Oil Corporation, Standard Oil Company (New Jersey) and The Texas Company are reported to be making definite plans for greater development and wildcat drilling in the area between the Nile River and the Red Sea, in Egypt. Producing wells in the Egyptian fields played a major role in supplying crude oil on the spot for the needs of the Allies during the crucial months of the North African campaign.

Peruvian Government Sponsors Explorations

The government of Peru has sent a party of geologists and engineers into the region adjacent to the headwaters of the Madre de Dios River, in the provinces of Madre de Dios and Cuzco, to explore the petroleum possibilities of the area. The group will spend from 12 to 15 weeks in reconnaissance work in that region of plains and foothills east of the Andes.

Texas Well Permits

Texas Railroad Commission last week approved permits for drilling 147 wells in Texas. There were 42 in Southwest Texas, 35 in West Texas, and 23 in North Texas, 18 in the Gulf Coast, 12 in West Central Texas, ten in the Panhandle, and seven in East Central Texas.

☆

C. F. SPEARY, president of Link Oil Company, Tulsa, died at Baltimore August 21, following an operation. He was a pioneer oil and gas producer and operated extensively in Ohio, West Virginia and Oklahoma.

Oil Needs Well Met Through Peak Crude Output and Near-Record Refinery Runs

Operations of the industry continued exceptionally active in the week ended August 19, and the current heavy demand for oils was satisfactorily fulfilled. Crude production again set a new record, and crude runs to stills were increased sharply to within 58,000 barrels of the highest recorded daily average runs. Production of gasoline and residual fuel oil increased and permitted substantial additions to storage, and although distillate fuel production decreased, it remained sufficiently high to continue adding to stocks. In consequence of the high crude production, stocks of crude were increased, after having declined steadily in earlier weeks.

U. S. crude production averaged 4,675,000 barrels daily, up 8000 from the week before and 457,000 daily or 10.8 percent above a year previously. Runs to stills were increased 134,000 barrels daily to 4,694,000 per day, and the latter rate was 600,000 daily or 14.7 percent above runs in the like week last year. Crude stocks rose in the week of August 12 by 666,000 barrels to 223,597,000, but still were 12,923,000 barrels or 5.5 percent lower than a year previously. Those stocks are around the lowest level for 22½ years.

Gasoline production, including natural blended at refineries, averaged 1,951,000 barrels daily, up 7000 from the previous week and 230,000 daily or 13.3 percent above a year ago. Stocks accumulated at the rate of 92,000 barrels daily and rose to 81,850,000 barrels, which was approximately 10,000,000 barrels or 14 percent more than the 71,742,000 barrels held August 21 last year.

Distillate fuel production averaged 688,000 barrels daily, down 22,000 from the week before but 98,000 daily or 16.7 percent above a year before. Stocks were increased 39,000 daily and then totaled 40,308,000 barrels, an amount 4,526,000 barrels or 12.6 percent greater than that of 35,782,000 barrels held a year previously.

Residual fuel oil production averaged 1,305,000 barrels daily, up 125,000 from the previous week and 92,000 daily or 7.6 percent more than in the corresponding week last year. Stocks were increased at the rate of 248,000 barrels daily but the 58,737,000 barrels held at the end of the week was 8,002,000 barrels or 12 percent less than the 66,739,000 barrels on hand a year before.

Personnel Tranfers Announced by Humble

Humble Oil & Refining Company announces the following transfers:

Sam F. Moore from the Greta District, Refugio, Texas, to the Scott and Hopper District, Falfurrias, Texas, as district chief clerk.

John B. Payne from Sunniland District, Everglades, Florida, to the Bayou Sale District, Franklin, Louisiana, as district superintendent.

Alfred J. Chesney from the Anna District, Natchez, Mississippi, to the Paradis District, Paradis, Louisiana, as district superintendent.

James I. Tuttle, district superintendent, from the Colorado District, Randado, Texas, to the Scott and Hopper District, Falfurrias, Texas.

J. I. Cochran, district superintendent, from Paradis, Louisiana to the North Crowley District, Crowley, Louisiana.

Joe G. Sloan, district superintendent of the North Crowley District, Crowley, Louisiana, to the Louisiana Division Office, New Orleans, as assistant division superintendent.

West Texas Crude Being Shipped to East Coast

Tank car shipments of West Texas crude to the Atlantic Coast have been revived to the extent that 21,500 barrels of mixed grades are being loaded by Atlantic Pipe Line Company at Midland for rail movement to Pittsburgh, thence to Philedalphia on consignment to the Atlantic Refining Company.

Preferred grades of oil from Ordovician fields in Winkler and Pecos Counties are being moved by rail from Midland to the Philadelphia plant, and also the Socony-Vacuum Oil Company's Paulsboro, New Jersey, refinery, aggregating 3500 barrels daily. The scheduled movement of 20,000 barrels of West Texas oil daily to Pacific Coast plants is being held in abeyance.

Trends of Operations and Changes in Stocks

Figures on crude stocks are from Bureau of Mines weekly reports; all others from American Petroleum Institute weekly reports, which are estimates on Bureau of Mines basis.
(All figures in thousands of barrels—add 000)

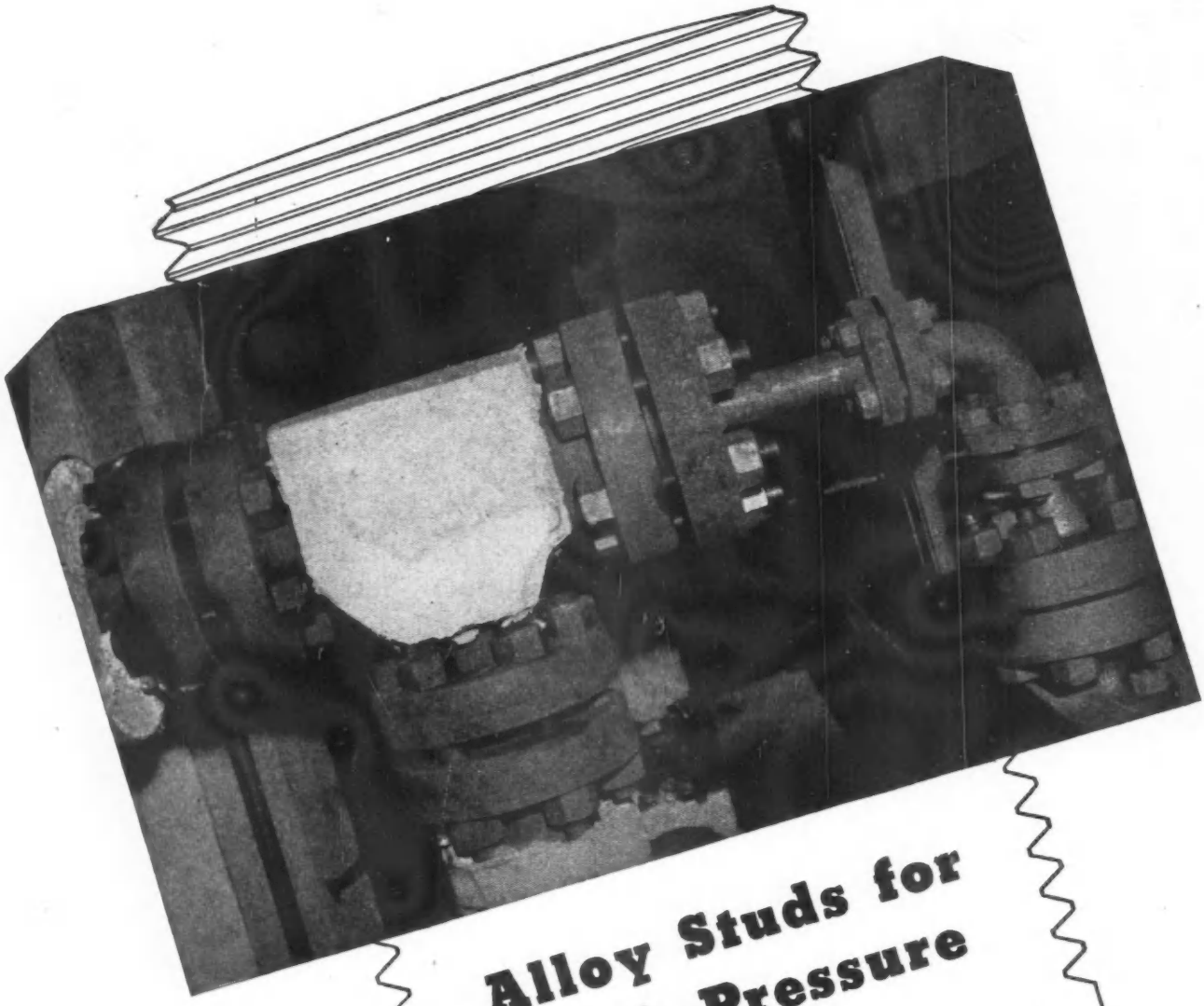
HIGHS AND LOWS OF RECENT YEARS

ITEM	Crude Oil Prod. Barrels Daily	Crude Oil Prod. Week Ended	Runs to Stills Barrels Daily	Runs to Stills Week Ended	Crude Stocks Barrels	Crude Stocks Week Ended	Gasoline Stocks Barrels	Gasoline Stocks Week Ended	Gasoil and Distillate Stocks Barrels	Gasoil and Distillate Stocks Week Ended	Residual Fuel Oil Stocks Barrels	Residual Fuel Oil Stocks Week Ended
Highs:												
1941	4,337	11–22	4,120	10–18	266,187	3–29	99,727	3–29	[1]54,983	11–15	102,448	1– 4
1942	4,337	2– 7	3,961	1– 3	263,208	3–28	[1]109,281	3–14	49,861	11–14	95,857	1– 3
1943	4,436	11–13	4,331	12– 4	245,752	5–29	94,159	3–20	46,187	11–27	[2]72,881	1– 2
1944	[1]4,675	8–19	[1]4,752	6–17	240,992	1– 1	89,162	4– 1	42,310	·-1	58,737	8–19
Lows:												
1939	[3]1,601	8–26	3,125	2–18	[2]229,127	10–12	71,152	10– 7	20,722	4–15	105,397	4– 8
1941	3,364	1–11	3,490	1–18	240,399	11–15	79,923	10– 4	28,382	4–12	90,914	7–12
1942	3,297	7– 4	3,393	5–23	231,896	12–12	75,934	12– 5	29,240	4–25	72,962	12–26
1943	3,821	1– 9	3,579	3–13	232,191	1– 9	68,182	10–16	30,732	4– 3	57,596	12–25
1944	4,357	1– 1	4,228	2–12	[4]222,931	8– 5	76,302	1– 1	30,232	4–29	49,737	3–18

TRENDS OF 1943 AND 1944

Trends in Week Ended:	Crude Oil Production Daily	Crude Oil Runs to Stills Daily	Crude Oil Stocks Week End	Gasoline Production Weekly	Gasoline Stocks Week End	Gasoil and Distillate Production Weekly	Gasoil and Distillate Stocks Week End	Residual Fuel Production Weekly	Residual Fuel Stocks Week End
1943:									
January 2	3,871	3,734	233,938	10,957	82,420	4,285	42,913	7,683	72,881
January 30	3,826	3,698	233,863	10,339	88,830	3,888	37,057	7,452	70,763
February 27	3,873	3,709	235,217	10,566	93,157	4,230	32,939	7,839	70,140
March 27	3,896	3,742	239,126	10,231	94,079	3,541	30,980	8,018	67,938
April 24	3,913	3,737	242,035	10,583	91,001	3,954	31,142	8,168	67,455
May 29	3,970	3,679	245,752	10,656	83,937	3,798	32,274	7,672	67,682
June 26	3,955	4,015	242,657	11,092	79,589	3,876	34,044	8,126	67,960
July 31	4,133	3,788	238,420	11,127	74,977	3,765	36,363	8,478	66,877
August 28	4,196	4,227	236,170	12,420	72,525	4,351	37,928	8,732	67,250
September 25	3,344	4,156	233,013	12,206	70,024	4,608	40,328	8,580	66,659
October 30	4,383	4,176	237,219	12,813	69,297	4,642	44,591	7,968	63,833
November 27	4,414	4,261	239,761	12,638	69,980	4,379	46,187	8,633	62,143
December 25	4,363	4,185	241,310	12,597	74,024	4,457	43,791	8,689	57,596
1944:									
January 1	4,357	4,453	240,992	13,192	76,302	4,575	42,310	9,141	57,330
January 29	4,400	4,359	240,251	13,427	81,085	4,054	37,266	8,889	52,857
February 26	4,423	4,377	237,137	13,183	85,248	4,558	33,766	8,952	51,387
March 25	4,385	4,443	236,285	13,362	87,287	4,979	31,319	9,013	51,669
April 1	4,383	4,435	234,667	13,824	89,162	4,450	30,530	8,367	51,326
April 29	4,431	4,300	235,342	13,126	88,462	4,284	30,236	8,398	49,985
May 27	4,514	4,532	234,423	13,502	86,468	4,702	32,035	8,568	49,812
June 3	4,523	4,620	234,476	13,680	87,084	4,890	32,586	9,157	50,283
June 10	4,523	4,670	231,290	14,220	86,911	4,996	33,669	9,008	51,221
June 17	4,568	[1]4,752	230,565	14,398	85,268	4,870	34,137	9,489	52,017
June 24	4,583	4,638	229,332	14,066	86,000	4,337	34,328	8,961	52,757
July 1	4,587	4,638	228,860	14,052	83,559	4,496	35,360	8,872	52,235
July 8	4,579	4,645	[2]226,424	13,539	83,709	4,548	36,189	9,009	53,686
July 15	4,602	4,575	226,513	14,083	82,252	4,842	37,171	8,587	54,332
July 22	4,615	4,684	[2]225,294	14,243	82,150	5,073	37,513	8,947	55,315
July 29	4,608	4,627	225,112	14,115	82,665	4,833	38,135	8,900	56,280
Aug. 5	4,651	4,529	[2]222,931	14,144	80,801	4,969	39,410	8,443	56,572
Aug. 12	4,667	4,560	223,597	13,708	81,203	4,976	40,035	8,264	57,003
Aug. 19, 1944	[1]4,675	4,694	.....	13,757	81,850	4,819	40,308	9,136	58,737
Aug 21, 1943	4,218	4,094	[5]236,520	12,147	71,742	4,131	35,782	8,494	66,739
Change:									
In week	+8	+134	+666	+49	+647	—157	+273	+872	+1,734
In year	+457	+600	—12,923	+1,610	+10,108	+688	+4,526	+642	—8,000
In year	+10.8%	+14.7%	—5.5%	+13.3%	+14.1%	+16.7%	+12.6%	+7.6%	—12.0%

[1] All time peak. [2] Lowest between January, 1922 and July 1, 1944. [3] Lowest since October, 1922, due to shutdown of six Mid-Continent states. [4] Lowest since January, 1922 [5] Stocks, August 14, 1944.



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Bethlehem threaded fastenings are on the job in this high-pressure oil line in a large refinery, holding flanges tight, preventing leakage, demonstrating remarkable ability to withstand difficult operating conditions.

Bethlehem threaded fastenings are thoroughly dependable because they have the necessary stamina and toughness to withstand severe conditions of temperature, stress, vibration and shock.

Our 87-acre fastenings plant at Lebanon, Pa., is prepared to furnish fastenings of special alloy steels conforming to ASTM Specification A-193-40T for temperatures over 750 deg. F.; and for lower temperatures, triple-alloy steels such as NE8740, and heat-treated carbon steels conforming to ASTM Specification A-261-43T.

Make Bethlehem your source of supply for alloy-steel studs, bolts, set screws, and heat-treated nuts.

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BETHLEHEM MAKES EVERY TYPE OF FASTENING

U. S. Field Operations

Oklahoma

Garvin, Carter Counties Are Sharing Limelight

While West Edmond continues the hot spot in Oklahoma, Garvin and Carter counties are sharing the limelight.

In Garvin County, Ed Kubat of Oklahoma City is preparing to test Dixon 1, NE SW SE of 9-3n-2e, half mile east of Pauls Valley. The wildcat recovered 4,000,000 feet of gas and a spray of oil on a 30-minute drill stem test in the Pennsylvanian at 3468-78 feet. Shows were also reported in the Bromide at 3538 feet. Total depth is 3610 feet.

About six miles east of the East Pauls Valley pool Sinclair Prairie Oil Company appears to have opened a new field following drill stem test at Allred 1, NE NW SE of 20-3n-3e. Opened 30 minutes, the test recovered 1020 feet of dark brown oil and 15 feet of oil-cut mud at 1898-1909 feet. The show is at the contact of the Pennsylvanian with the Simpson shale with the formations logged a 1000 feet higher than in the general area, indicating excessive truncation in the structure.

Carter County: The Texas Company's Chubbee 4, SE NE SW of 5-5s-1w, in the new Southwest Lone Grove pool, looks like a good producer. At 2930-42 feet a 20-minute drill stem test recovered about two million feet of gas and approximately 60 barrels an hour of 36.8-gravity oil. The producing horizon, which was expected to dip in this well, flattened out, indicating the pool may cover a larger area than expected. In the same section The Texas Company's Duke 1, SE SW NW of 5-5s-1w, logged 9 apparently productive sands in the Pennsylvanian zone from 3412 to 3895 feet ranging from 8 to 41 feet thick. Operator is still completing the well, which made 200 barrels in 3 hours and 642 barrels in 24 hours.

West Moore: Mid-Continent Petroleum Company completed Mullins 2, NE SE SW of 29-10n-3w, Cleveland County, through perforations in the second Wilcox at 8768-75 and 8790-8817 feet. The well flowed through bottom-hole choke at the rate of 270 barrels of oil daily. Westermier 2, NE NW SW of 26-10n-3w, is drilling below 4000 feet. Mid-Continent has five producers in the field. Dry holes northeast and south of producers are restricting the area to narrower limits than was first expected.

West Edmond: The pool chalked up two more producers with several slated for early completion. Sinclair Prairie Oil Company's Ringer 2, C SW NE of 6-13n-4w, perforated the Hunton at 6966-70 feet and flowed 480 barrels of oil in a little more than 3 hours with 2,000,000 feet of gas. Phillips Petroleum Company's Bluff 1-A, C NW NW of 16-13n-4w, on a state lease, set pipe at 6878 feet, drilled in to 7010 feet, acidized with 1000 gallons and flowed 295 barrels of oil in about 3 hours through tubing choke. Sohio Petroleum Company is preparing to test Habbens 1, C NW NE of 4-13n-4w, and has set pipe in Hassell 1, C SW SE of 5-13n-4w; Phillips, Anderson-Prichard Oil Company and Peppers Refining Company are slated to add new producers in the next few days, all three tests checking normal.

Pawnee County: Kerlyn Oil Company has staked Barrier 1, NW NE NW of 22-23n-5e, east of the new Watchorn pool on a seismograph picture and geology. Phillips Petroleum Company and The Texas Company are supporting the test with acreage purchases. The well will be drilled to the Arbuckle lime.

Bryan County: Up-tilted formations are causing considerable trouble in making straight hole in two wildcat tests in an area southwest of Durant. Atlantic Refining Company's State 1, SE SW SW of 36-7s-8e, is drilling below 3565 feet and Magnolia Petroleum Company's State 1, SW NE SW of 6-7s-9e, after reaching total depth of 4562 feet found the hole crooked and plugged back to 2900 feet to start new hole.

Caddo County: Derrick has been erected and surface pipe set in the directional well to be drilled in an attempt to kill Little Nick Oil Company's Rigney 4, SW SE NW of 12-5n-9w, wild gasser on the east side of the Cement pool which has been blazing and out of control for several weeks.

Kansas

Four Producers Given State Potentials

Four new producers were given state potentials last week, while a total of 464 oil wells were completed in the first 7 months of the current year for an aggregate daily production of 313,629 barrels or an average of 676 barrels per well.

Potentials were given Derby Oil Company's Kruckenberg 1, SE SE NW of 13-19s-15w, Barton County, 143 barrels daily from Arbuckle lime at 3558 feet; Continental Oil Company's Monroe 2, SE SW SE of 4-18s-14w, Boyd pool, Barton County, 1214 barrels daily from Arbuckle lime at 3460 feet; Sinclair Oil Company's Blurton 1, SE NE NE of 24-15s-14w, Chitwood pool, Pratt County, 163 barrels daily from Arbuckle lime at 3336 feet, and R. H. Shield's Miller 3, NE SW SE of 31-14s-13w, Hall-Gurney pool, Pratt County, 446 barrels daily from Lansing-Kansas City lime at 3930 feet.

Barton County: Sohio Petroleum Company is extending the Ainsworth pool a mile east with Lang 1, NW NE NE of 36-16s-13w, which is making 50 barrels of oil daily on pumping test from Lansing lime at 3352-55 feet. Total depth is 3363 feet. On initial drill

Wells Completed in the United States in Week Ended August 26, 1944

Data preliminary and subject to revision. Revised and more complete data on all completions shown in monthly summary of drilling, published in second issue of each month. More detailed data on wildcats published in third issue of each month.

State or District	FIELD COMPLETIONS: New Wells *Oil	Gas	†Input	Dry	Total	Old Wells Deepened	WILDCAT COMPLETIONS *Oil	Gas	Dry	Total	ALL COMPLETIONS This Week	Last Week	Cumulative This Year	Cumulative Last Year
Alabama	....	....	....	....	....	....	....	....	....	....	....	....	17	2
Arizona	....	....	....	....	....	....	....	....	....	....	....	....	6	....
Arkansas	....	....	....	....	....	....	....	....	....	....	....	6	140	170
California	32	....	....	....	32	....	1	....	4	5	37	40	1,322	901
Colorado	2	....	....	....	2	....	....	....	....	....	2	1	17	21
Florida	....	....	....	....	....	....	....	....	....	....	....	....	1	1
Georgia	....	....	....	....	....	....	....	....	....	....	....	1	3	2
Illinois	35	....	....	6	41	3	2	....	9	11	55	50	1,254	1,144
Indiana	2	2	....	3	7	....	....	....	2	2	9	9	197	167
Iowa	....	....	....	....	....	....	....	....	....	....	....	....	2	3
Kansas	22	2	2	1	27	....	1	1	9	11	38	21	1,158	1,074
Kentucky	13	....	....	4	17	....	....	....	3	3	20	9	481	222
Louisiana	7	....	....	....	7	....	....	....	....	....	7	16	478	....
North Louisiana	....	....	....	....	....	....	....	....	....	....	....	5	160	175
South Louisiana	7	....	....	....	7	....	....	....	....	....	7	11	318	230
Michigan	3	5	....	2	10	....	....	....	....	....	10	7	408	357
Mississippi	....	....	....	....	....	....	....	....	....	....	....	2	111	59
Missouri	....	....	....	....	....	....	....	....	....	....	....	....	21	15
Montana	20	4	....	7	31	....	....	....	2	2	33	1	222	152
Nebraska	....	....	....	....	....	....	....	....	....	....	....	....	8	31
New Mexico	2	....	....	5	7	....	....	....	....	....	7	7	261	156
New York	15	....	10	....	25	....	....	....	....	....	25	25	834	764
Ohio	5	8	....	3	16	....	....	....	....	....	16	11	523	574
Oklahoma	22	1	2	1	26	....	1	1	10	12	38	39	1,173	859
Pennsylvania	25	7	17	....	49	....	....	....	....	....	49	54	1,868	1,612
Tennessee	....	....	....	....	....	....	....	....	....	....	....	....	9	6
Texas	87	4	....	25	116	6	10	2	32	44	166	131	3,966	2,604
E. Tex. Bor. Co.'s	1	....	....	....	1	....	....	....	1	1	2	....	15	16
E. Texas Field	....	....	....	....	....	....	....	....	....	....	....	....	3	5
Rest of E. Texas	2	....	....	1	3	....	1	....	....	1	4	3	190	144
North Texas	25	....	....	10	35	2	....	....	7	7	44	30	913	635
W. Central Tex.	....	....	....	1	1	....	1	....	1	2	3	16	274	239
West Texas	30	1	....	2	33	1	4	....	9	13	47	28	1,043	567
Tex. Panhandle	6	2	....	1	9	....	....	....	....	....	9	11	172	132
G. Coast, Upper	8	....	....	2	10	1	1	....	3	4	15	7	371	203
G. Coast, Lower	13	....	....	5	18	2	2	1	9	12	32	20	623	390
Southwest Texas	2	1	....	3	6	....	....	1	2	3	9	14	295	235
S. Central Tex.	....	....	....	....	....	....	1	....	....	1	1	2	67	38
West Virginia	4	17	....	2	23	....	....	....	....	....	23	16	582	402
Wyoming	14	....	....	....	14	....	....	....	....	....	14	....	106	81
Total U. S.	310	50	31	59	450	9	15	4	71	90	549	446	15,168	11,784

* Includes distillate wells. † Includes salt water disposal wells.

stem test the hole filled with 1500 feet of oil.

Harvey County: Wolf Creek Oil Company has a possible pool opener in Schrag 1, NW NW SW of 5-22s-2w, 6 miles west of the Graber pool. Operator is perforating in the Mississippi lime at 3211-13 and 3263-66 feet to test a good oil show. Lime was based at 3470 feet with Misener topped at 3543 feet, Hunton at 3544 feet, Simpson, where a slight oil show was reported, at 3690 feet and Arbuckle at 3800 feet.

McPherson County: Deep Rock Oil Corporation plans a deep wildcat test about 2 miles northwest of the new Derby pool and has staked Miller 1, NE NW SW of 26-18s-2w. Hessum Drilling Company has the contract and the drilling block includes the east half of section 27, northeast half of section 34, south half of the northwest quarter and north half of the southwest quarter of section 26 and 80 acres in section 35.

Decatur County: Sinclair Prairie Oil Company has staked Bremer 1, NW NW SE of 28-4s-28w, wildcat 30 miles northwest of the small Studley pool in Sheridan County.

Missouri

Caldwell County Well Ready to Test Hunton

Cities Service Oil Company tested salt water and abandoned Cool 3, SW NE NW of 32-65n-39w, in Atchison County. Water showed at 1451 feet in the Bartlesville. Operator's Cook 4, SW NW NW of 32-65n-39w, has set and cemented pipe on top of the Bartlesville at 1447 feet and is preparing to test.

Holt County: Miller et al's Moss 1, wildcat in the C NW NW of 4-59n-37w, near Oregon, based the Mississippi lime at 2055 feet and was drilling in the Hunton with cable tools.

Caldwell County: Todd et al's Mabe 1, W½ SE of 28-55n-29w, is preparing to test the Hunton topped at 1152 feet. The zone was acidized and 2-inch tubing with packer set at 1357 feet, 18 feet from bottom.

Sales of Falls City Pool Being Negotiated

Negotiations for the sale by Ohio Oil Company of its 24 producers in the Falls City pool of Richardson County to a Tulsa group headed by the Abe Stekoll Oil Company, are in progress with the consideration for the wells and leases reported about $85,000. The wells are producing about 300 barrels daily. The pool was opened about 5 years ago by the Pawnee Royalty Company which sold the discovery well and its leases to Ohio Oil Company.

New Oklahoma Oil and Gas Fields to Be Named

The nomenclature committee of the Oklahoma section of Mid-Continent Oil & Gas Association, will meet in Tulsa, August 29, to consider names for oil and gas fields discovered in the state since June and to name several new oil and gas areas which were passed at the last session.

West Texas

Andrews County Test Is Producing from Devonian

Mid-Continent Petroleum Corporation's University 1-7, 1½ miles southeast of production in Fullerton field, Andrews County, recorded a potential of 3744 barrels of 40-gravity oil, with gas-oil ratio of 342/1, on ¾-inch choke. The potential is based upon last half of 6-hour gauge, with a flow of 173 barrels the first hour and 154 barrels during each of the last 2 hours. Pressure on casing and tubing equalized at 800 pounds while shut in for the test, and dropped to 700 and 425 pounds, respectively, at end of the gauge. Production is from perforations at 8460-8600 feet in Devonian, which heretofore was restricted to the Crossett pool as a source of production in Texas.

Oil produced by this new-pay strike and extension well is about on a par with the regular Clear Fork production in the Fullerton field. The gasoline has an octane rating of 47, while sulphur content is only .38 percent. An analysis of the crude shows 31.6 percent 375° F. end point gasoline, 19 percent kerosene, 9 percent gasoil, 23 percent paraffin distillate, and 16.6 percent residium (150 viscosity). Magnolia Pipe Line Company is building a 4-inch extension line to the well. Mid-Continent Petroleum Corporation is starting University 1-11, C NE NW Section 29, Block 13, and southwest of its deep strike, which had indicated a big well prior to the University of Texas lease sale on August 18 when nearby tracts brought the biggest cash offers. Gulf Oil Corporation set the pace in paying $362,000 cash for lease on S½ Section 33, Block 13, and $261,000 for N½ Section 34, ranging from 1-2/3 to 2¼ miles southeast of the well.

Extensions: The Texas Company's Jones 1, Shafter Lake area, Andrews County, 1¾ miles north of production, pumped 153 barrels of oil and 35 barrels of water initial after 1500-quart nitro shot at 4370-4488 feet, having plugged back from Glorietta at 6242 feet. In Cochran County, The Falcon Company's Dean-Texas Company 1, 1⅞ mile northeast of Dean pool and possible link for the latter with the Slaughter and Northwest Slaughter areas, pumped 68 barrels of 29-gravity oil and 28 barrels water initial after acidizing through perforations at 4928-45 feet and open hole at 5012-35 feet. San Andres Production Company's Clouser 1, 2½ miles northeast and northwest of isolated production in the Northwest Slaughter area, pumped 189 barrels of oil initial after acidizing San Andres pay at 4860-77 feet. The Cochran County extensions will result in considerable development.

Crockett County: Amerada Petroleum Corporation's Todd 5-A confirmed the Tood Deep area for flowing production from Ellenburger in gauging 312 barrels of 41.3-gravity oil, with gas-oil ratio of 708/1, on 14-hour natural test through 1-inch from perforations at 6130-6210 feet. A small well from this zone was previously indicated by Continental Oil Company et al's Todd 10-B, but was sealed off. The deeper zone was also sealed off in Todd 5-A, which flowed 1184 barrels of 41.6-gravity oil, with gas-oil ratio of 628/1, on natural potential test through 1-inch from Crinoidal perforations at 5727-5915 feet. The company elected not to make a dual completion because of paraffin content of the Crinoidal oil.

Discovery: Honolulu Oil Corporation and Devonian Oil Company's Payton 1, Northwestern Garza County and 12½ miles northwest of production, pumped 131 barrels of 35-gravity oil and 30 barrels of water initial after acidizing pay at 3546-64 feet, having plugged back from water at 3768 feet. In Pecos County, Humble Oil & Refining Company's Williams 1, 7½ miles northwest of Fort Stockton and 5-1/3 miles east of production, flowed 22 barrels of 35.7-gravity oil, with gas-oil ratio of 1560/1, on ¼-inch choke for completion from Yates sand perforations at 2840-80 feet, having plugged back from 3604 feet. The company has 2 more wells, both outposts, in process of completion from same zone.

Prospects: Humble Oil & Refining Company's Jackson 1, Southeastern Lamb County, entered granite at 7185 feet, being the second highest granite top for the area, and will set pipe to test numerous oil shows passed up in Basal Permian between 5304 and 6400 feet. Stanolind Oil & Gas Company's Midland Farms 1-J, 3½ miles east of the company's recently discovered Midland Farms pool, Andrews County, cemented 7-inch at 4722 feet after plugging back from water at 4876 feet to try for completion in pay, topped at 4795 feet. In Pecos County, Humble Oil & Refining Company's El Paso State National Bank 1, 6 miles southeast of the Heiner 2-well Ellenburger pool, was drilling plugs from 5½-inch at 5445 feet, or 4 feet off bottom. This wildcat entered Ellenburger at 5425 feet, and showed considerable 36-gravity black oil with rotary returns before running pipe.

Reagan County: Amerada Petroleum Corporation's Hickman 4, northwest outpost for Barnhart field, logged base of black shale at 9078 feet, or 160 feet low to producer ½-mile to the east, and will complete from good porosity in Ellenburger at 9101-9203 feet. The company's Hickman 5, an inside test, based the shale at 8848 feet, and logged pay zone at 8867-8900 feet, but will continue to the lower Ellenburger. It is now apparent that the field's producing area is about defined.

West Central Texas

Jones County Registers Semi-Wildcat Producer

Jones County registered a prolific semi-wildcat producer when Merry Brothers & Perini and Alder Oil Company's Herndon 1, S.P.Ry. Section 19, Block 2, made steady flow of oil through casing from soft lime at 2384-88 feet in Flippen, topped at 2373 feet. No tankage was available for gauge, and the flow was killed to connect up for completion. It is ½-mile east of a 2500-foot small discovery pumper in the Upper Hope section drilled in October by the partnership.

Stephens County: Sinclair Prairie Oil Company's Atkins 16-a, 2⅓ miles southeast of Brownville pool, nearest Mississippian area, fulfilled earlier prospects of proving this deeper zone in an old Bend lime area in flowing 168 barrels of 42.9-gravity oil natural on 3-hour test through ¾-inch from perforations at 4245-90 feet. The gas yields

2 gallons of gasoline per 1000 feet, and showed ratio of 603/1 on official test. Company proposes to skid rig for northeast offset, giving Gulf Oil Corporation 2 offsets.

Mudge Oil Company's Adams 1, 1¼ miles northwest and southeast of nearest production and 12 miles south by west of Breckenridge, failed to revive production indicated before landing pipe at 3375 feet, but logged more pay in deepening from 3422 to 3428 feet in Bend, topped at 3374 feet. It will be shot with nitro. Humble Oil & Refining Company's Green 1-B, wildcat in Northwestern Stephens County, was drilling shale at 4040 feet. Two Ellenburger tests in the East Ibex deep pay area were being completed by Phillips Petroleum Company. Wild 2, 1018 feet east of its discovery, entered Ellenburger at 4350 feet, or 3 feet high, and will complete with spudder at 4391 feet, while Wild North 1, north offset to the deep strike, was testing at 4392 feet, having entered the Ellenburger at 4368 feet, or 16 feet low.

Concho County: Natural gas flow rated at 2,600,000 feet daily has been developed by the City of Eden from pay at 3279-91 feet while seeking fresh water. This is the only gasser in the county, while a few wildcat oil pumpers are inactive.

Texas Commissioner Approves Oil Agreement

Railroad Commissioner Ernest O. Thompson has announced his approval of the plan relating to petroleum recently agreed upon between the United States and Britain, expressing the opinion that this method of cooperation between the nations would be as effective as the Interstate Oil Compact has been between the states.

Thompson emphasized that there is nothing new in cartels, so far as the United States is concerned; that we have entered into such programs and we are now party to those on sugar, timber, tin and other commodities. With the establishment of a definite board, where free discussion can be had, most of the problems can be worked out by agreement, he said. In the event countries other than the United States fail to enforce a reasonable conservation program, they face United States invasion of their markets, just as the United States might fear such an invasion. Thus, the plan would be beneficial to all.

The commissioner had no fear that the plan would result in curtailing production of fields in this country unreasonably, or to the disadvantage of the producers here.

Spacing Hearings

Texas Railroad Commission has scheduled a hearing for September 5, to consider a five-acre spacing program for shallow wells in McCulloch County.

On the same day, the Commission will consider adoption of a ten-acre spacing pattern to apply to producing depths less than 1500 feet sub-surface, in the Howard-Glasscock Field, Howard and Glasscock Counties.

☆

G. E. SWEENEY, production superintendent for Sun Oil Company in the Texas Panhandle and Permian Basin, has transferred headquarters from Dallas to Midland.

North Texas

Southwestern Cooke Has New Oil Area Pending

Southwestern Cooke County has a new oil area pending through Phillips Petroleum Company's Bailey Inglish-Eppie 1, J. F. Davidson Survey A-336, having logged oil saturated conglomerate at 2420-45 feet that yielded 1080 feet of oil and 90 feet of rotary mud with good gas blow on drill stem test.

No water was encountered in deepening to granite at 2508 feet, where operations were halted to set pipe for completion. The Ellenburger dolomite, normal source of production for the area, was not encountered. This strike is 3 miles southwest of 1300-foot production opened in 1930.

The Texas Company's Rasure 1 projected Ordovician test for the Sivels Bend Geophysical prospect, was drilling shale 6273 feet, having logged considerable sand zones without shows.

Archer County: Consolidated oil Company and Premier Oil Refining Company's J. L. Prideaux 1-D, ⅔-mile west of their Garrett Pool Strawn discovery, tested salt water at 3794 feet in sand topped at 3783 feet. Phillips Petroleum Company's Sterrett 1, east outpost for the Holliday deep area, found water in Ellenburger at 4904-84 feet, and will try for completion in upper sand at 1586-96 feet. Ohio Petroleum Company's Britton 1, northeast outpost for the same area, was abandoned after showing water in Ellenburger, topped at 4904 feet, and 7 feet low to Sterrett 1.

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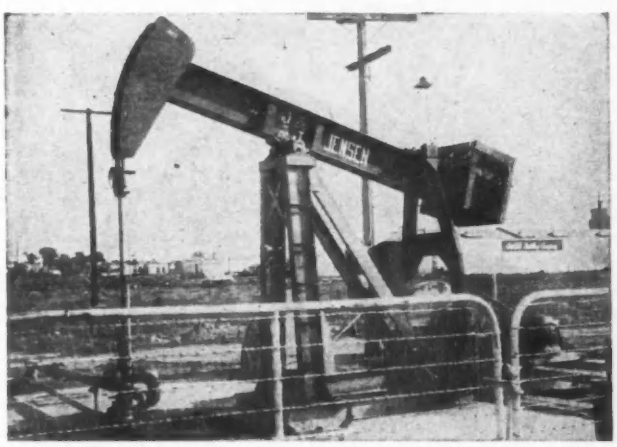

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Southwest Texas

Nueces Oil Well Is First Pfleuger Sand Producer

Ginther, Warren & Ginther's Mrs. Lena Grebe 2, which opened a new pay in the Agua Dulce field, Nueces County, is the first oil producer in the Pfleuger sand. With casing perforated with 24 shots from 6806-18 feet, it flowed 152.88 barrels of 40-gravity oil, no water, in 24 hours through a 3/16-inch choke with tubing pressure 650 pounds and casing pressure 1225 pounds. Gas-oil ratio was 1100/1. The well is located in Section 195, Bishop Subdivision of Palo Alto Grant, and the Texas Railroad Commission has set a hearing for September 1 on whether the well will be granted a new-field allowable.

In the Brayton area, just outside the Agua Dulce field limits, H. R. Smith & W. C. McBride's Rivers Estate 2, 2200 feet northwest of the well which opened this new area, has been completed and gauged 30,000,000 feet of gas, open flow potential, with 20 barrels of condensate per million feet of gas, from perforations at 6592-6638 feet, in a sand higher than that found in the discovery well which produced from 7197-7205 feet. The discovery produced 40-gravity oil instead of the gas and distillate from the new well. Also in the Brayton area, Sun Oil Company's A. S. Harlan 3, in Section 174, flowed 113 barrels of oil daily through a 9/64-inch choke from perforations at 7198-7206 feet.

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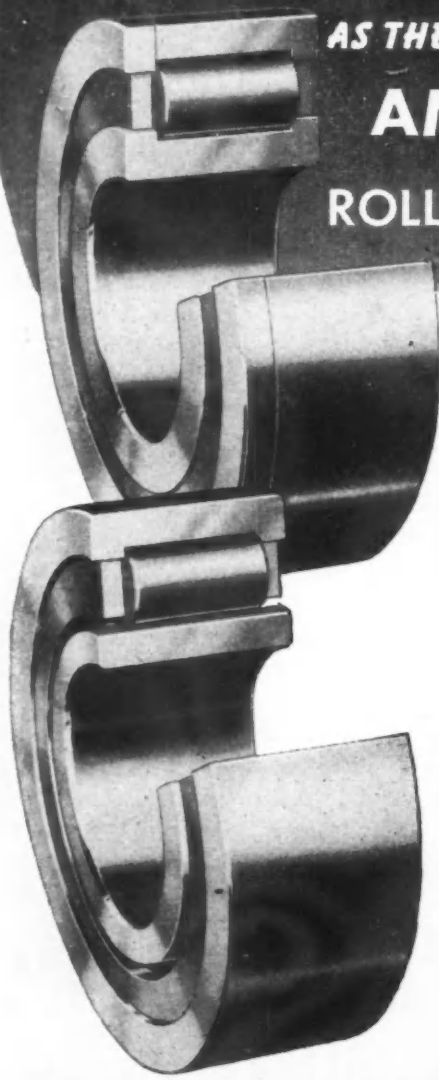

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San Patricio County: Humble Oil & Refining Company's Green Estate 2, northeast of the discovery well in the Gregory field, is preparing to make a squeeze job on the perforations at 8503-05 feet. The latest drill-stem test, open 1½ hours and using 3/16-inch bottom and 5/8-inch top chokes, flowed 39 barrels of fluid in an hour, of which 16 percent was salt water, the remainder oil.

Stanolind Oil & Gas Company will drill Welder Ranch Lands 2 as a new wildcat in the Calallen area. Located on a 2000-acre lease in the V. Tares Survey, it will go to 8000 feet.

Stanolind's George R. Clark 2, a mile northeast of Stanolind's Clark 1, a gas producer at 4800 feet, in the Riverside Area, is opening oil production from sand at 6282 feet. Drilled to 6561 feet, casing was set to 6430 feet and perforated in a 1-foot section at 6282-83 feet, flowing 45 barrels of 49.6-gravity oil in 5½ hours of a 10-hour drill-stem test using ¼-inch bottom and ⅛-inch top chokes with gas-oil ratio only 800/1. Operators recovered 22 stands of oil and 3 stands of fresh water when the tool was pulled, and are now running tubing for a production test.

Zavala County: Humble Oil & Refining Company's Ike T. Pryor, wildcat 3½ miles southeast of LaPryor, is below 5500 feet, drilling in shale.

Texas Gulf Coast

Jackson Pastures Field Extended by New Well

Texas Gulf Production Company and Tide Water Associated Oil Company's Jackson 1 has extended the Jackson Pastures field, Chambers County, ½ mile northeast and established the first oil production in an area which had produced gas and condensate. With casing perforated at 8125½-28 feet, first tentative gauge shows the well flowing at the rate of 150 barrels of 37.8-gravity pipe-line oil daily through ⅛-inch choke with tubing pressure 2375 pounds, casing sealed.

Meanwhile, Sun Oil Company's J. E. Jackson 1, the same distance southwest of the discovery well at Jackson Pastures, has been completed as another gas-condensate producer flowing 24 barrels of condensate in 15 hours through a ⅛-inch choke with tubing pressure 2875 pounds, shut in, along with a large amount of gas. Completion was in the same sand with casing perforated at 8122-24 feet.

Matagorda County: The Texas Company is preparing to drill a deep wildcat in the southwest portion of the county, its C. G. Hamill 4 being located 1½ miles north of the shore of the Gulf of Mexico in the Wm. Baxter Survey, south of the town of Sargent. It is 4100 feet southeast of a dry hole.

Fort Bend County: Locations have been made for two new tests in the new South Needville area, Fort Bend County, recently opened by British-American Oil Producing Company, and Walter Goldston. Both operators have completed oil wells in new sands in an area separated from the original gas area by faulting. PAW has set up the area as an oil producer and not subject to the restrictions imposed on gas or gas-condensate fields, as long as completion is made in the new sands

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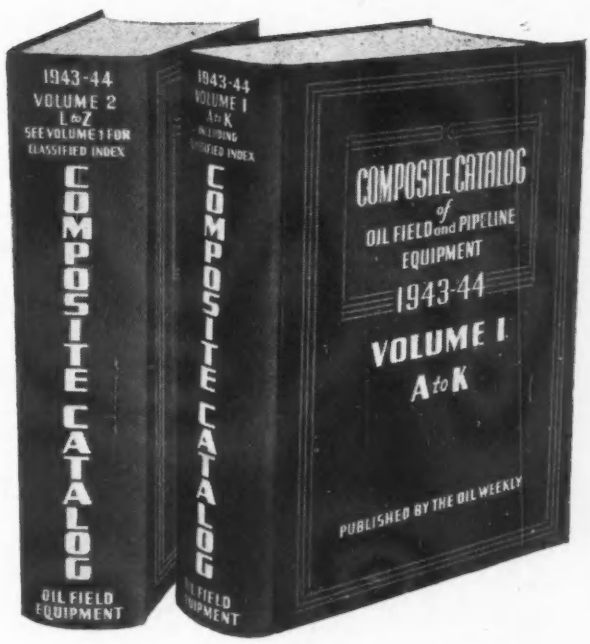

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found at 6000, 6300, 6400, and 6500 feet. New locations were made by Goldston for E. C. Farmer 2, 1954 feet northeast of the recently completed Farmer 1, and for E. C. Farmer 3, easterly offset to Ed Hurta 1.

The Katy Gas Field has been extended into Fort Bend County with completion of Humble Oil & Refining Company's Katy Gas Field Unit II, Well 16, on the south side of the field, producing an ungauged amount of gas under closed-in tubing pressure 1700 pounds and casing pressure 1800 pounds. Perforations were at 7264-86 feet with total depth 7296 feet.

Wharton County: Edwin Nielsen et al's Winnie Poole 1, which extends gas-condensate production in the Lissie area ½ mile to the west, was dually completed, perforating in upper sand at 6444-48 feet and 6468-72 feet for a potential of 3,000,000 cubic feet of dry gas daily through a ¼-inch choke. Lower sand was perforated at 6602-06 feet, where it made 10 barrels of 55-gravity condensate daily and 2,250,000 cubic feet of gas daily through a 3/16-inch choke, tubing pressure 2000 pounds. Total depth was 7204 feet.

Brazos County: Phillips Petroleum Company's Fanny Schoeps 3, deep test on the Millican Dome, was drilling below 7100 feet in shale. This well, in an area where Wilcox is found at a comparatively shallow depth, is scheduled to drill to 12,000 feet, which should be deep enough to reach the Lower Cretaceous, first such well for the Gulf Coast with the exception of Magnolia's Lauter 1, now drilling below 7500 feet in the Clay Creek field of Washington County, headed for the same objective.

East Texas

Wood Test Attempting To Tap Travis Peak Pool

Gulf Oil Corporation's Hornbuckle 1, second test for the Winnsboro 2-pay pool, Wood County, is attempting to add the Travis peak as an additional source of production after taking in more than 400 feet of this zone in drilling to 9141 feet. Production test is underway from perforations at 8940-79 feet. The company's discovery made steady flow from perforations at 8263-88 feet, then completed in upper Rodessa at 7990-8014 feet.

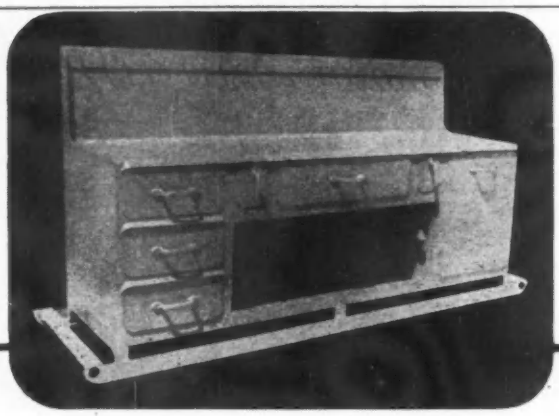
Deep Prospects: Ohio Oil Company et al's Coker 1, Henderson County Travis peak project, was coring dry gray lime 8605 feet, having logged base of anhydrite at 8490 feet, being low for the district. In Van Zandt County, The Texas Company's Easley 1 plugged back from 9116 feet to 8180 feet, then drilled out to 8220 feet to make drill-stem test of porous zone in Rodessa, topped at 8211 feet. Paul B. Scott et al's Woodson 1, Hunt County, was idle for repairs at 2688 feet in Woodbine, topped at 2588 feet, being unusually high for this area. Nominal show of oil in rotary cuttings in the chalk series is generally discounted.

Manziel Field: Amerada Petroleum Corporation and Shell Oil Company's Hague 1, discovery of second deep pay, was flowing oil and wash-water into pits while cleaning out to indicate a commercial completion. Production is from perforations at 8754-75 feet in 4-inch liner set at 8784 feet after 36-quart nitro shot at 8754-78 feet. Open hole prevails to 8850 feet. This strike is 1600 feet northeast of a small flowing well from Rodessa at 8455-8525 feet.

Red River County: The Texas Company's Solomon 1 entered the Cotton Valley at 5050 feet and dry Smackover lime at 5920 feet to become the shallowest for this zone in East Texas. It was drilling dry lime and shale at 6060 feet.

Bowie County: Barnsdall Oil Company and Sohio Petroleum Company's Gifford-Hill Company 1, 1000 feet west of their Smackover lime oil strike for the Eylau prospect, marks the beginning of development of their 4000-acre discovery block. The partnership have leased all open acreage in vicinity of Eylau and on the northeast side of their original block, paying up to $50 per acre cash with some over-riding royalty concessions. Hunt Oil Company has taken a block near Berry, paying an average of $7.50 per acre, while this is flanked on the north and west by a 3500-acre block taken for Phillips Petroleum Company, which core-drilled the area.

Cherokee County: W. H. Foster and Phillips Petroleum Company's Bowling 1, projected Travis Peak test for the Lone Star pool, was drilling 6750 feet, having logged upper anhydrite stringers.



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Illinois Basin

Four Recent Discoveries Registered in Kentucky

In Henderson County, C. D. Burbank added a new horizon to the Smith-Mills pool at Fee 10, 3-P-21, and National Associated Petroleum Company discovered a new pool at Rudy 1, 4-O-23.

Burbank's well found pay in the Tar Springs sand at 1910-20 feet and is awaiting cement after setting 7-inch casing. Oil and some water showed on a drill stem test.

National Associated's well, 4 miles northwest of the Robards pool, found pay in the Cypress sand at 2245-51 feet and during a drill stem test, showed 1500 feet of oil in an hour. Five and a half inch casing was set to test.

Carl Sneff's Page 1, 9-L-21, in Webster County, a mile southeast of the Clay pool, opened a pool with Pennsylvania sand production from pay at 1005-25 feet. The well pumped 124 barrels of oil in 24 hours.

The Union County discovery was Gulf Refining Company's Rankin 1, which was completed as a Waltersburg sand producer. Located in 16-Q-20 5 miles from produtcion in the Uniontown pool, the well pumped 68 barrels in 24 hours from Waltersburg sand at 1810-25 feet.

Illinois

Outstanding in Illinois was completion of The Pure Oil Company's Guyot 1, SW SW SW 36-3n-8e, in the Noble Consolidated pool for a flow of 1100 barrels of oil in 24 hours from McClosky lime. Pay was encountered at 3015 feet with total depth 3105 feet. The well was treated with 5000 gallons of acid.

Douglas County: Ohio Oil Company's Shaw 1, SW SW SW 36-16n-8e, a wildcat near Tuscola, is drilling below 1900 feet with cable tools on a projected 6000-foot test.

Crawford County: M. L. Miller's Waggoner 1, W½ SE SW 25-5n-13w, has set casing for test of Benoist sand at 1651-67 feet.

North Louisiana

Bienville Parish Field May Have First Producer

The Bear Creek field in Bienville Parish, heretofore producing nothing but gas and some distillate, may soon have its first oil producer, according to indications in Southern Natural Gas Company's T. J. Cummings 1, which is completing from casing perforations at 6745-65 feet in the Pettit formation. The well drilled to 7443 feet in Travis Peak formation, set casing at 7172 feet, and after perforating made a drill stem test using ¼-inch chokes that flowed 42-gravity oil at the rate of 4 barrels per hour. Gas-oil ratio was reported reasonably low and no salt water showed. Production test is under way.

Lincoln Parish: The California Company's Norris 1, in Section 15-18n-1w, has a liner below the casing at 9117 feet, and will make first production tests in sands below the casing seat. After setting casing as protection to a gas-distillate pay previously drilled, it was drilled to 9768 feet before stopping to run the liner.

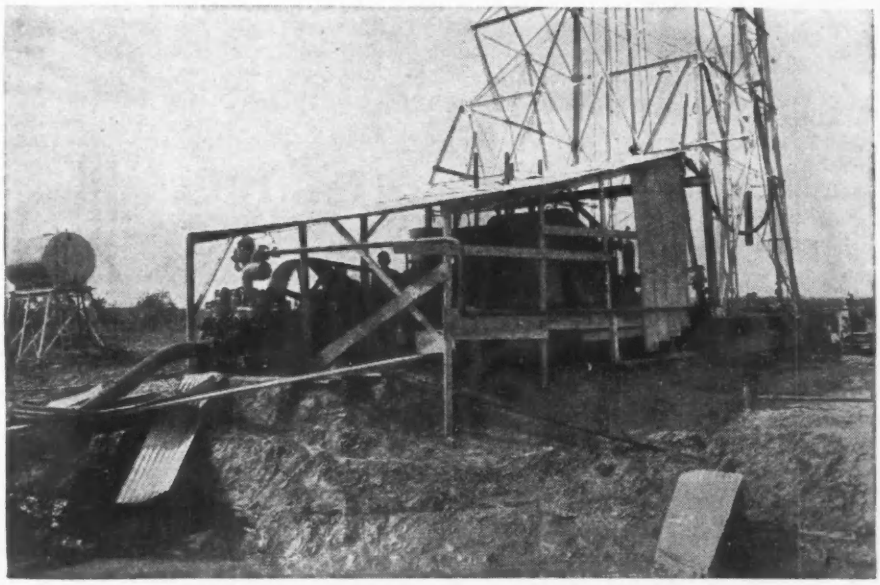
De Soto Parish: A. W. Phillips & G. C. Schoonmaker's Anthony A-1, located on the old Spider prospect, Section 9-11n-14w, has snubbed tubing in the hole after perforating casing with 16 shots at 4876-80 feet, and is testing after treatment with 5000 gallons of acid. Tanks and separator have been moved in. On preliminary tests it has been estimated good for 100,000,000 cubic feet of gas daily along with a small amount of distillate.

Bossier Parish: Barnsdall Oil Company's J. T. Hanks 1, wildcat 6 miles northeast of Benton found top of the Cotton Valley between 7440 and 7450 feet and is drilling at 7668 feet, scheduled to go to 8800. No showings have been found.

J. A. Johnson et al's J. J. Guy 1, in Section 3-11n-13w, 5 miles south of Mansfield, is opening a new oil field with preliminary testing showing a flow of 50 barrels during the first 24 hours through a ⅛-inch choke from 2736 feet. Casing had been set at 2728 feet after coring 3 feet of coarse, saturated sand, and the hole was then drilled to 2736 feet before running tubing for produtcion test. At the time of the gauge, tubing pressure was 600 pounds and casing pressure 1100 pounds. The operators hold a 4000-acre block around the discovery.

☆

A. W. HUTCHINGS has been appointed manager of Century Drilling Company at Carmi, Illinois.



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South Louisiana

St. Charles Discovery Proves Itself in Test

The Pure Oil Company's General American Transportation Company 1, which recently opened a new oil field in the Good Hope area of St. Charles Parish is now flowing through a small choke, making pipe line oil at a good rate. Originally tested through a 9/64-inch choke at the rate of 10 barrels per hour, it was later placed on a 7/64-inch choke and flowed 38 barrels of 36-gravity crude oil in 6 hours, under tubing pressure of 1260 pounds, with casing sealed. Gas-oil ratio has not been taken, but apparently is low. Total depth is 10,171 feet, 5½-inch casing cemented at 7919 feet, and perforated with 40 shots at 7830-38 feet. Storage is on the lease for present production, but no pipe line connection has been made. The Texas Pipe Line Company serves several fields in this area.

Acadia Parish: Union Sulphur Company's Gueno 3, Section 51-8s-2e, in the Branch field, is preparing to make production test which may open a new deeper pay sand for the area. The well drilled to 11,316 feet and has liner set to 11,125 feet for a test of sand showing oil logged at 11,044-104 feet. The discovery well was drilling during 1942 when it blew out from 10,447 feet, running almost wild for a number of months before being brought under complete control. Production totaled 2400 barrels of 51-gravity condensate daily during a large part of the time it was flowing through open lines.

Amerada Petroleum Corporation is testing Daigle F-1, outpost 3400 feet southeast of production in the South Lewisburg area. With total depth 10,600 feet and 5½-inch casing set at 10,513 feet, casing was perforated at 10,405-415 feet for the first test. Results have not been reported.

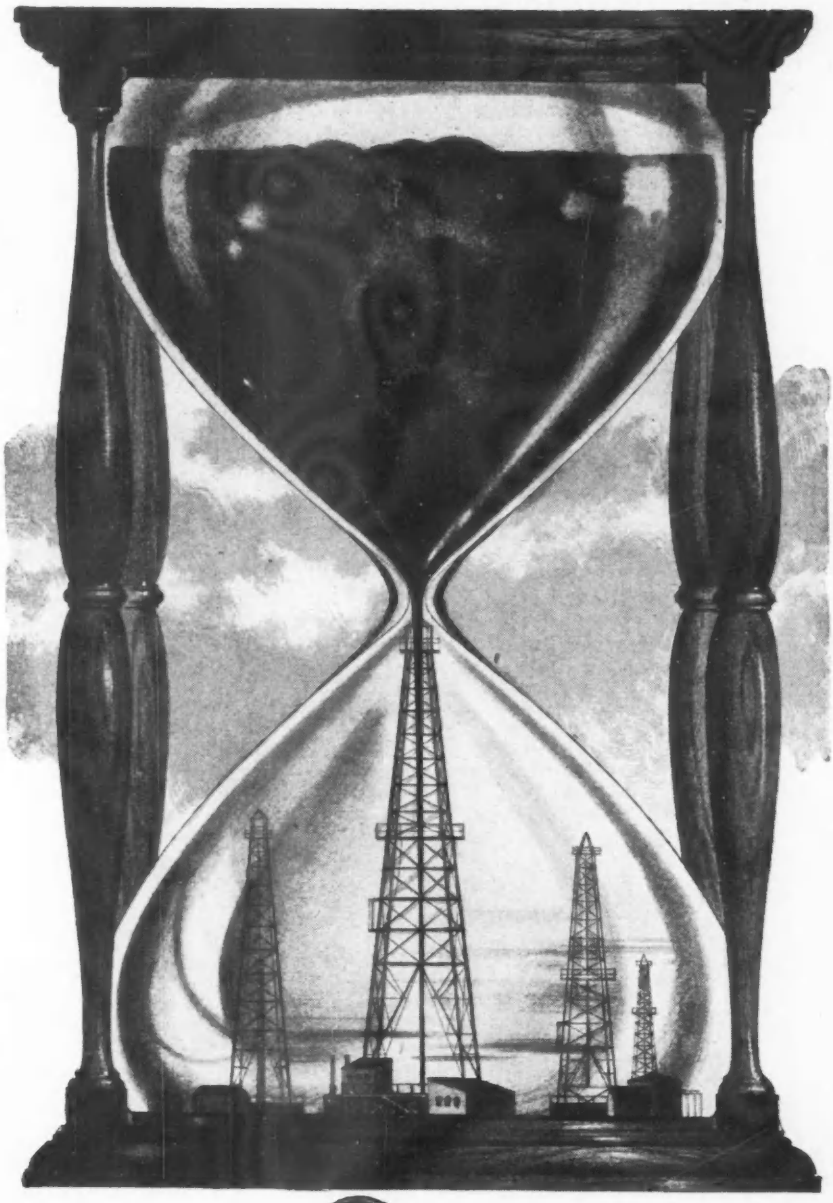
Terrebonne Parish: The Texas Company has extended the Dog Lake field slightly with completion of State-Dog Lake 12-1 on the southwest flank, flowing 367 barrels daily through a 5/32-inch choke from the 9000-foot sand after going into salt, being still in that formation at depth 9475 feet. Casing was set to 9395 feet.

Vermilion Parish: Union Oil Company's State-White Lake A-2, ¾ mile northwest of the discovery well for the West White Lake field, has squeezed perforations at 10,680-686 feet, and will re-perforate for another test, since the first test recovered gas, salt water, and a little oil, fluid being only about 5 percent oil.

PAW has relaxed restrictions on the upper oil pay in the Erath field by amending the declaration of oil-producing limits of this upper pay to include the whole field instead of a small area, with drilling allowed on 40-acre spacing throughout the field disregarding producing or producible wells in the deep gas-condensate pay.

☆

GEORGE F. RUSSELL, for 5 years in the natural gasoline division of Phillips Petroleum Company at Bartlesville, Oklahoma, has been named assistant professor of chemical engineering at the University of Oklahoma.



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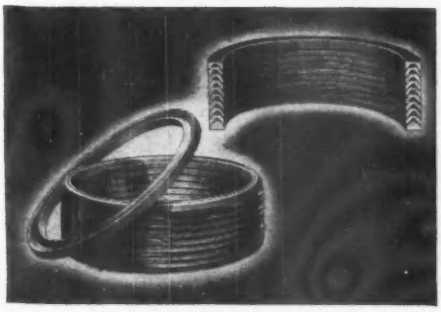

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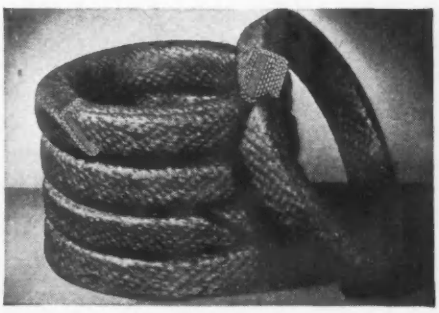

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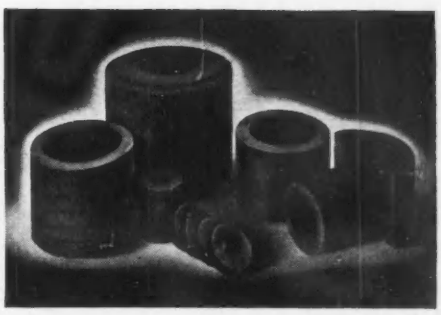

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Mississippi

Adams County Producer Extends Cranfield Field

The California Company's Natural Gasoline Corporation 7, in Adams County, has extended the Cranfield Field 1¼ miles south with completion from perforations at 10,322-360 feet in the Tuscaloosa. On a 24-hour gauge flowing through 5/32-inch choke it made 410 barrels of oil with tubing pressure 1950 pounds. Total depth is 10,412 feet with casing cemented at 10,407 feet.

The Pure Oil Company's McDowell 2, wildcat in Section 12-6n-3w, is drilling below 10,360 feet in shale with nothing showing.

Lincoln County: The California Company's W. C. Douglas, wildcat southwest of Brookhaven, is reported perforating casing for the first production test in the Tuscaloosa, which is expected to show some oil. After coring sand showing saturation with 35-gravity oil at 10,533-563 feet, the well drilled to 10,641 feet in shale and the showing was checked with electric log. Casing was set, and first test should be completed soon.

Jasper County: Kingwood Oil Company's E. V. Hill 1, Jasper County outpost well, is extending the Heidelberg field a mile south. It was swabbing at the rate of 8 barrels of oil an hour, only 1 percent wash water now showing, and had not kicked off and started flowing. Perforations were made at 4814-26, 4920-26 feet, and 4931-33 feet.

Jefferson Davis County: Sid W. Richardson's C. E. Berry 1 has been shut in after making initial test which opens a new gas-distillate field for Mississippi. Perforating at 8075-8105 feet and at 7855-80 feet, it was dually completed, making 40 barrels of distilate and 3,700,000 cubic feet of gas daily through a 3/16-inch tubing choke from perforations at 8120-32 feet, and 23 barrels of distillate along with 3,400,000 cubic feet of gas daily from the sets of perforations first listed above.

Decatur County Test Drilling at 4220 Feet

H. L. Hunt's Metcalf 1, only well now drilling in the state, located in Land Lot 260, Land District 21, Decatur County, is drilling at 4220 feet in shale.

In Mitchell County, Stanolind Oil & Gas Company is still using its Pullen 1 for geophysical purposes since drilling stopped at 7484 feet in granite.

Alabama

Stanolind Wildcat Shows 6,000,000 Feet of Gas

Stanolind Oil & Gas Company's Jack Woods A-1, wildcat in Section 23-14s-15w, has killed the gas flow and was drilling below 2586 feet. At 2420-22 feet, a gas sand had been found from which the well showed an estimated 6,000,000 feet of gas daily. Earlier, 750,000 feet of gas daily had been found just below 325 feet.

In Choctaw County, H. L. Hunt's Land 2, west of the Gilbertown field, was still testing at plugged-back depth of 2800 feet, where it was reported swabbing as much as 20 barrels of oil per hour. Same operators' Scruggs 1, also west of the Gilbertown field, has shut down to rig up pumping equipment and probably will make a small producer from the Eutaw just above 3460 feet.

Humble Oil & Refining Company's Skinner 1, deep test in Escambia County, is drilling at 10,531 feet in shale and sand.

Florida

Preparations Under Way For Several Wildcats

Although Stanolind Oil & Gas Company, The Pure Oil Company, Humble Oil & Refining Company and Consumer Gas Company are moving in or preparing to move in for wildcats, actual drilling operations in Florida are limited to 3 wells.

Humble's deep test in the Sunniland area in Collier County, the Gulf Coast Realties 2, is drilling below 12,955 feet in lime with no more trouble encountered since the recent fishing job.

In Dade County, Humble's State 1 is drilling at 4415 feet in anhydrite, lime, and chalk. Wm. G. Blanchard's Everglades 1 was drilling below 10,188 feet at latest report.

Blanchard's Grossman 1 in Dade County, and C. L. Arter's National Turpentine & Pulp Company 1 in Alachua County, are still shut down at shallow depths, where they are in surface formations.

Arkansas Producers Ask For Price Adjustment

Producers of Arkansas crude have asked the OPA to eliminate the differential of ten cents a barrel now existing against oil produced in the Atlanta, Buckner, Lewisville, Magnolia, Midway, Schuler and Village fields.

The producers contend there is no difference in quality which would account for the price difference; that oil produced in these fields is largely comingled in pipe line and refinery streams with higher-priced crude produced elsewhere; and that the fields in question were discovered and first developed during a period of depressed economic conditions and were accordingly priced subnormally.

The production of the seven fields amounts to less than 30,000 barrels daily.

To Sell Pawnee Leases

Oil and gas leases on 27 tracts comprising 2218.64 acres will be offered for sale by the Pawnee Indian agency at Pawnee September 28. Sealed bids will be received up to 2 p.m. on date of sale. The tracts are in Pawnee, Payne and Noble Counties.

MARSH CANNON, 76, who entered the oil industry 40 years ago with the Guffey-Gillespie Oil Company, died in Tulsa August 11. He was associated with the late Charles Farren in developing the Garber, Oklahoma, oil pool, and later was superintendent of production for the Continental Oil Company.

Rocky Mountain Area

New Pay Zone Found In Spindletop Field

A new productive zone has been found in the Spindletop field in Natrona County, Wyoming. Encouraged by Continental Oil Company's discovery of oil in the Embar on Gebo, Hot Springs County, Wyalta Oil Company drilled 1-D in SE SE SW 32-30n-81w, 221 feet into the Tensleep sand to a depth of 2445 feet. Top of the Tensleep was logged at 2224 feet and perforated between 2250-2268 feet. On swabbing test, the well produced 40 barrels of oil per hour. Five and one half inch production string was cemented at 2385 feet.

Frannie: Continental Oil Company established the water line for the Madison in the Frannie field with the abandonment of its Government 1-A, SW NE SE 25-58n-98w, an outpost at the extreme southeastern end of the field. The well was drilled to 3371 feet and a drill-stem test of the Madison at 3348-3360 feet showed fresh water.

Cisco: Continental Oil Company & Union Oil Company of California's joint test of the Cisco dome in Grand County, Utah, west of the Colorado state line, Cisco-Unit 1, SE SE NE 23-20s-21e, drilled into granite and has been abandoned at 4743 feet. Cisco, before its abandonment in 1935, produced gas from the Dakota at 1950 feet and the lowest horizon previously tested was the Morrison.

Farmington: A test of the showing of oil logged at 1738-1747 feet in the Madison in Union Oil Company's Greene 1, CWL SW SW 28-25n-3w, wildcat test in the Farmington district, showed it to be non-productive, producing only 2 barrels of 21-gravity oil with 19 barrels of sulphur water on 24-hour test after treatment with 1450 gallons of acid.

California

Field Opened in Gosford Area of Kern County

A new oil field was opened in the Gosford area, Kern County, by the completion of an edge well, Tide Water Associated Oil Company's KCL 44-22, 22-30-16. Shows were reported for two prospective discoveries, one a new oil field in the San Joaquin area of Fresno County, and the other, a gas field in the Alpaugh area of Kings County.

The Gosford discovery is in one of several domes located by seismograph adjacent to the Ten Section field. Initial production gauged 143 barrels net of 38-gravity oil, with a cut of 5 percent. The find is in the Stevens sand of Miocene age.

The Fresno prospect was found in Superior Oil Company's Brackney 68, 30, 30-15-17, wildcat about 5 miles southeast of nearest production, in the Helm field. On formation test of 6993-7010 feet, 1000-foot cushion, open 12 minutes, gas in 10 minutes, recovery was 1050 feet of 27-gravity clean oil and 150 feet of mud.

The gas showing reported from an Alpaugh area wildcat in Kings County, Standard Oil Company of California's Cutter Unit 1, 29-32-23, was a forma-

mation test recovery unofficially estimated at 9,000,000 feet rate, from interval 3375-3425 feet. Recovery from a test of an upper showing between 2780-2845 feet, was all salt water.

Six new wildcats were started, two of which are tries for natural gas. Four failures were reported.

Imperial County: Wildcat drilling is temporarily finished in the Imperial Valley play. The third and last of initial tests that all failed to develop oil showings of any consequence, O'Quinn & Hadley's wildcat in 11-9-12, Salton Sea area, was abandoned at 1960 feet.

Kern County: Known limits of the new Section 27 Pool, Buena Vista Hills, were extended 2 miles in a southeasterly direction when Standard Oil Company of California's wildcat in 1-32-23 found the main sand in a high structural position between 3360 and 3475 feet. Successful completion will prove up a large additional ultimate recovery to be credited to this discovery.

E. B. Hall & Company's test of the intermediate area between the McVan pool and the new Conoco field, in Hunt 1, 28-27-27, found no producible extension of either pay. Oil sand was logged at 1900 feet but not enough to justify a production test.

San Mateo County: The Half Moon Bay area test drilled by Richfield Oil Corporation in 13-7-5, found no showings in objective sands, but is being drilled to formations at lower levels, last reported depth being 4538 feet.

Michigan

Two Oil Pays Logged by Mecosta County Wildcat

Chapman Oil Company's Telzlaff 1, S½ NW SW 4-15n-9w, Mecosta County, logged Dundee at 3476 feet and picked up water at 3580 feet. When deepened into the Monroe lime the wildcat logged oil pays at 3601-15 and 3639-41 feet. At 3641 feet the well showed 1700 feet of fluid, 1100 feet of oil and 600 feet of water. Drilled to 3675 feet it flowed, but no new pay was believed logged. Operators plan to re-set 5-inch casing through the Dundee-Monroe water break and test.

Sun Oil Company's Church 1, S½ SW SW, 1-16n-8w, Chippewa Township, logged pay at 3916-17 feet. The well flowed 90 barrels of oil the first hour, 235 barrels in 3 hours, and 397 barrels the first 7 hours before being shut in for storage. It extends the old Fork field a mile west in the biggest single extension in the field's two-year development.

Smith Petroleum Company's Buss 1, S½ NW NE 16-16n-7w, a mile southeast of Fork field, logged Dundee at 3777 feet and pay at 3781½ feet, making a 24 barrel flow before acid treatment. After the shot it flowed 90 barrels in 16 hours with a trace of water.

Ogemaw County: Sun's Holshoe 1, N½ SW SE 17-22n-4e, Logan Township outpost, logged Dundee at 2727 feet and a show of oil at 2831 feet before picking up 500 feet water at 2952 feet. Casing will be re-set and test deepened to Richfield at 4000 feet.

☆

PAUL F. SULLIVAN, formerly in the scouting department of Ashland Oil Refining Company, has been transferred to the Mt. Carmel, Illinois, office.

WESTERN CANADA

South Alberta Plains Blocks to Be Developed

McColl-Frontenac Oil Company and British Dominion Oil & Development Corporation will develop 5 blocks on the Southern Alberta plains, involving 85,358 acres. The companies will drill a minimum of 3 joint wells.

The initial test, McColl-Frontenac-British Dominion No. 12-17-1-17, has been staked in lsd 12 17-1-17w4th, on the north extension of the Hay Lake Nose Oilfield of Montana. The site is 2¾ miles north of the International Boundary, and 6 miles north of producers on the Hay Lake Nose. The well will be carried 100 feet in the Madison limestone, testing prospective oil and gas horizons. The companies hold 28,648 acres on the block.

Imperial Oil Ltd. has started 2 wildcats in the Taber area of the South Alberta plains. Imperial-Hudson Bay-Barnwell No. 1, is in lsd 15 8-9-17w4th, in the Southwest Taber area, a half mile northwest of Major-Taber No. 1 discovery well. Imperial-Leth No. 1, is in lsd 4 27-8-16w4th, in the South Taber area, 5 miles southeast of Standard of B.C.-Nassau Exploration oil wells, and 4½ miles northwest of the 1 and 2 wells, now under test.
Imperial-British Dominion-Conrad Nos.

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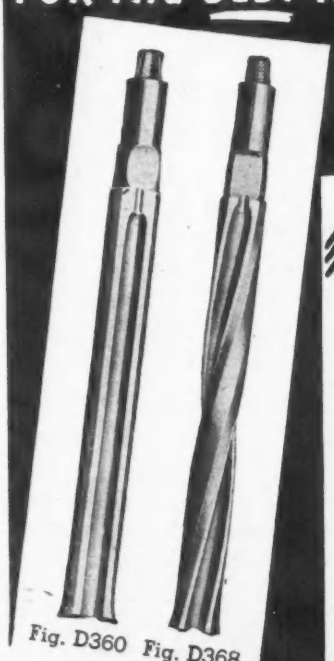

Fig. D360 Fig. D368

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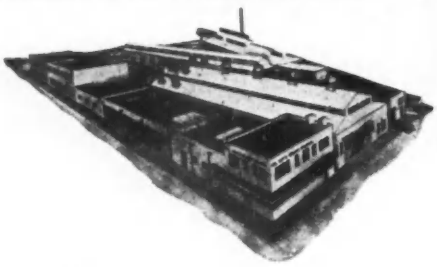

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CALIFORNIA WILDCATS

Imperial County—Failure: O'Quinn & Hadley's All-American Acres Comm. 1, sw sw nw 11-9-12, Salton Sea area, no show, abnd in silt 1450 ft.

Kern County—Discovery: Tide Water's KCL 44-22, se se nw, 22-30-26, new pool ne Ten Section nw Canfield Ranch fields, pump 143 bbls 22 hrs, 38-gr oil, 8 bbls wtr, perf 7935-7950 ft, td 8152 ft, pb 8060 ft.

Kern County—Failures: B. C. Morrison's 1, se se se 4-27-27, McVan area, top Eocene 4555 ft, Vedder 3555 ft, basement 5195 ft, abnd 5205 ft.

U. S. Drilling Co.'s S.P. 3, sw ne sw 23-28-28, Shark Tooth area, Vedder 2690 ft, wet, abnd 2713 ft.

Los Angeles County—Failure: General Exploration Co.'s Dominguez 2, 750 ft n 1250 ft w c/l Carson St. and w/l L. A. Flood Control channel, no show, abnd 7780 ft.

ILLINOIS WILDCATS

Edwards County—Oil Discovery: Fox et al's Thompson 2, sw sw sw 3-3s-13w, pump 45 bbls, Penn 1144-61 ft, td 1161 ft.

Fayette County—Failure: Magnolia's Carsons et al 1, ne se ne 8-8n-2e, abnd 2032 ft.

Gallatin County—Failure: Ryan's Glover et al 1, ne se sw 21-7s-9e, abnd 3087 ft.

Hamilton County — Oil Discovery: Nat. Assoc. Pet.'s Johnson 2, ne sw se 10-5s-7e, pump 60 bbls, Aux Vases 3384-94 ft, td 3401 ft.

Jasper County—Failure: Gross et al's Danly 1, nw nw ne 24-5n-10e, abnd 3039 ft.

Montgomery County — Failure: Northern Ordnance's Adams 1, ne se 28-8n-4w, abnd 323 ft.

Richland County—Failures: Jackson's McDonald 1, sw sw sw 14-2n-10e, abnd 3366 ft.

Cardinal Oil's Miller 1, nw se sw 2-3n-9e, abnd 3025 ft.

St. Clair County—Failure: Skelly's Schiekedang 1, ne se nw 12-3s-6w, abnd 2805 ft.

Washington County—Failures: Smokey Oil's McWilliams 1, nw nw se 28-2s-2w, abnd 1836 ft.

Rea's Bonaszek 1, se nw ne 27-3s-2w, abnd 1300 ft.

INDIANA WILDCATS

Adams County—Failures: Texas Co.'s James 1, sw sw ne 19-27n-13e, abnd 1185 ft.

Texas Co.'s Spehleger 1, ne se sw 31-27n-13e, abnd 1283 ft.

KANSAS WILDCATS

Butler County—Failure: Sohio's Wells 1, nec 30-28s-6e, Arb 3158 ft, abnd 3167 ft.

Cowley County—Failure: Zephyr Drlg.'s Bailey 2, ne sw se 8-33s-5e, abnd 2440 ft.

Ellis County—Failure: Phillips' Macher 1, se nw sw 23-14s-17w, Arb 3488 ft, Lamotte 3535 ft, abnd 3541 ft.

Finney County — Gas Discovery: Carter's Miller 1, nec sw 26-22s-34w, flow 700,000 ft gas, td 2633 ft.

McPherson County—Failure: Phillips' Vogts 1, nec 4-20s-1w, Miss 2930 ft, Anhy 3543 ft, abnd 3572 ft.

Osborne County—Failure: Stanolind's Ahrens 1, ne ne se 30-9s-14w, Arb 4005 ft, abnd 4058 ft.

Pratt County—Failures: Texas Co.'s Toland 1, ne ne sw 7-26s-13w, chert 4212 ft, Kinder 4264 ft, abnd 4496 ft.

Texas Co.'s Toland 1-B, c ne se 12-26s-14w, Kinder 3818 ft, abnd 4492 ft.

Hatfield et al's Lemon 1, nwc 33-27s-13w, Arb 4528 ft, abnd 4580 ft.

Stafford County—Failure: Appleman's Russell 1, swc 24-25s-13w, abnd 4309 ft.

Sumner County — Oil Discovery: Sullivan's Nixon 1, c ne ne 22-30s-1w, flow 209 bbls Simp 3925-29 ft.

KENTUCKY WILDCATS

Butler County — Failure: Juist's Forgy 1, 4-G-33, abnd 680 ft.

Henderson County—Failures: Carter's Denton 1, 23-O-23, abnd 2695 ft.

Gulf's Martin Heirs 1, 14-Q-20, abnd 2756 ft.

MONTANA WILDCATS

Pondera County — Failures: Hageman and Pond's Foltz 1, sw sw se 35-29n-2w, Ledger dist, base Ellis 2053, 1800 ft sulphur wtr, abnd 2057 ft.

Carter Oil Co.'s Warwick 1, c se se 14-28n-4w, West Conrad, Madison 2645-2646 ft, sulphur wtr 1800 ft, abnd 2656 ft.

OKLAHOMA WILDCATS

Creek County—Failures: Skelly's Dial 1, se ne se 36-14n-7e, Misener 3946 ft, Vi 4020 ft, 1st Wx 4069 ft, 2nd Wx 4100 ft, abnd 4120 ft.

Haddock's Sarnie 1, ne sw se 11-18n-9e, Bart 2383 ft, Miss 2710 ft, Vi 2987 ft, Wx 2990 ft, abnd 3020 ft.

Creek County — Oil Discovery: Sinclair Prairie's Watson 1, sw ne se 34-15n-7e, flow 220 bbls, td 3947 ft, pb perf 60 shots 2622-41 ft.

Garvin County—Failure: Cooper's Potter 1, sw se 8-4n-3e, abnd 2630 ft.

Hughes County—Failure: Texas Co.'s Nichols 1, se sw sw 33-9n-10e, abnd 3950 ft.

Logan County—Failure: Davon Oil's Chitwood 1, sw sw 15-16n-4w, Lay 5172 ft, abnd 5206 ft.

Noble County—Failure: British American's School 1-F, se ne nw 13-21n-3e, Misener 4221 ft, 1st Wx 4229 ft, 2nd Wx 4256 ft, abnd 4270 ft.

Noble County—Failure: Morgan's Devore 1, nw nw sw 17-24n-1e, abnd 2733 ft.

Okmulgee County—Gas Discovery: Long et al's Anthony 1, sw sw sw 33-16n-12e, flow 1,000,000 gas, sd 1048-80 ft, td 1082 ft.

Stephens County—Failures: Amerada's Wood 1, sw ne se 17-1n-8e, McLish 5608 ft, abnd 5820 ft.

Anderson-Prichard's Woods 2, se nw se 26-2s-7w, abnd 1980 ft.

Grimes' Hilderbrand 1, sw se nw 1-3s-7w, abnd 2151 ft.

WEST TEXAS WILDCATS

Andrews County—Oil Discovery: Phillips-Sunray Oil Corp.'s University-Andrews 1-H, c sw sw sec 37, blk 9, 2½ mi ne of isolated pumper on n end N. Cowden field, elev 3126 ft, anhydrite 1850 ft, Yates 3100 ft, frosted grains 3120 ft, brown lime 4260 ft, pump 121 bbls 30.5-gr oil, 16 bbls wtr, used 500 gals mud acid, shot 500 qts nitro 4605-96 ft, pay 4625-4717 ft, td.

Cochran County—Failure: L. A. Douglas-Al G. Hill's Sherill 1, c nw se PSL 10, blk W, elev 3928 ft, Yates frosted grains 2950 ft, San Andres 4208 ft, abnd 5200 ft.

Gaines County—Failures: Ray A. Albaugh-Whitaker Oil Co.'s Scanlan-Stanolind 1, c nw nw E.L. Ry. 115, blk M, elev 3145 ft, anhydrite 2080 ft, brown lime 3970 ft, San Andres 4590 ft, abnd 5005 ft.

Stanolind's Rilsey Est. 1, c sw ne D&W sec 79, blk H, elev 3181 ft, anhydrite 2106 ft, Yates 3200 ft, brown lime 4180 ft, abnd 5176 ft.

Texas Co.'s J. L. Brown 1 770 ft nsl 580 ft wel labor 8, Lge 311, Gaines CSL sur, Yates 3380 ft, brown lime 4520 ft, solid lime 4700 ft, abnd 5650 ft.

Garza County—Oil Discovery: Honolulu Oil Corp.-Devonian Oil Co.'s D. R. Dayton 1, 660 ft nsl 1980 ft wel T.T. Ry 1421, A-347, 12½ mi nw nearest prod, elev 2975 ft, anhydrite 1397 ft, pump 131 bbls 35-gr oil, 30 bbls wtr, 3000 gals acid 3546-64 ft, td 3768 ft, pb 3564 ft.

Hudspeth County—Failures: John C. Rogers et al's Cummings 1, c nw sw PSL 13, blk 70, abnd 325 ft.

John C. Rogers et al's Tidwell 1, 150 ft n 50 ft e of c of nw se PSL 19, blk 74, abnd 420 ft.

Pecos County—Failure: Standard of Texas' Trees 2, c nw se H&GN Ry. 27, blk 8, elev 2556 ft, anhydrite 1560 ft, Rustler 1690 ft, solid lime 2890 ft, limestone 3000 ft, abnd in Bonesprings 8232 ft.

Tom Green County—Failure: L. L. Ingraham et al's Pulliam 1, c se ne H&TC Ry. 12, blk 4, elev 2070 ft, abnd 1750 ft.

Ward County—Failure: Stanolind's Kaufman 1-B, c w¼ of w¼ H&TC Ry. 21, blk 5, elev 2505 ft, anhydrite 560 ft, Shipley 2760 ft, San Andres 3020 ft, Glorietta 4070 ft, abnd 4500 ft.

WEST TEXAS OUTPOSTS

Andrews County—Patillos Extension: Texas Co.'s Jones 1, c nw nw PSL 21, blk A-36, 1¾ mi n prod, elev 3163 ft, anhydrite 1730 ft, Yates 2820 ft, pump 153 bbls oil, 35 bbls wtr, shot 1500 qts nitro 4370-4488 ft, pay 4365-4490 ft, td 6242 ft in Glorietta, pb 4490 ft.

Cochran County—Dean Extension: The Falcon Co.'s Dean-Texaco 1, 660 ft out sec Lge 94, Mills CSL, 1⅞ mi ne Dean field, elev 3721 ft, anhydrite 2270 ft, brown lime 3780 ft, San Andres 4130 ft, pump 68 bbls 29.1-gr oil, 28 bbls wtr, 6500 gals acid via perf 4928-45 ft and open hole 5012-35 ft td.

WEST CENTRAL TEXAS NEW PAY TEST

Stephens County—Atkins Discovery: Sinclair Prairie's Atkins 16-A, 635 ft nsl 1980 ft ewl S.P. Ry. 19, blk 2, amidst sparsely developed Bend prod, elev 1186 ft, Bend 3193 ft, Marble Falls 3976 ft, Barnett 4206 ft, Mississippi 4241 ft, flow 1576 bbls, ¾-in natural perf 4245-90 ft td 4305 ft.

WEST CENTRAL TEXAS WILDCAT

Callahan County—Failure: R. S. Miesse et al's Griffin 1, 220 ft out nwc BBB&C Ry. sec 87, abnd 1564 ft.

SOUTH CENTRAL TEXAS WILDCAT

Atascosa County—Charlotte Discovery: Humble's E. J. Pruitt et ux 3, 2740 nw of sel 2000-ac lse 1000 sw at ra fr nel Antonio Estrada sur A-224 sect 3, Edwards 6869 ft, sd 6917 ft, flow 176 bbls 37.7-gr, 3/16-in, td 6923 ft.

SOUTHWEST TEXAS WILDCATS

Duval County—Failure: M. E. Davis' L. G. Denman 1, 1320 fr nl 6000 fr el blk 20 Realitos

The OIL WEEKLY'S TRADING POST

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1—5" Jack Shaft 4 speed Unitized National Draw Works.
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All equipment in first class condition and is located at Kilgore, Texas. Write Box 711, Longview, Texas.

■ FOR SALE: Two 75 KVA Westinghouse Electric Transformers; One 50 KVA General Electric Transformer, used six months, and in excellent condition. B. M. Jamison, Angleton, Texas.

■ FOR SALE: Board Road Lumber slightly used 200,000 board feet in Fig Ridge Field, Chambers County. V. W. Frost, 1644 Mellie Esperson Building, Houston, Texas.

■ FOR SALE: 10,000' of 2" pipe near Groesbeck, Texas. H. D. Biles, 706 First National Bank Bldg. Fort Worth, Texas.

SITUATIONS WANTED

■ DRILLING SUPERINTENDENT: With 15 years experience drilling and producing. Presently employed. Can furnish best of references present and past employers. Course in engineering. Married, sober and reliable. Wish change due to health conditions. Address: Box 487, Freer, Texas.

■ District supervisor of Seismic field operations and interpretations for major oil company, with eleven years geophysical experience in Gulf Coast and Mid-Continent, desires position as geophysical supervisor for independent or major oil company. Address: Box 86, c/o The Oil Weekly, Houston, Texas.

HELP WANTED

■ Assistant Superintendent Drilling and Operating: Either graduate Petroleum Engineer with drilling experience or graduate Mechanical Engineer with drilling experience. Age between 33 and 45. Give all personal data, transcript of college credits, and salary desired or application will not be considered. Address: Box 79, c/o The Oil Weekly, Houston, Texas.

■ Drilling Superintendent wanted by Contracting Company in Mid-Continent Area to handle a district working from five to eight rigs. Must be recognized, competent and experienced well man of middle age capable of planning and supervising complete drilling operations. All applications will be treated as confidential. None need apply whose character and ability will not stand a rigid investigation. Address: Box 85, c/o The Oil Weekly, Houston, Texas.

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1—Ideal 300 Ton swivel, model C-S, excellent condition.
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2—26" Wheland Oil bath rotaries, excellent condition.
1—27½" Ideal Oil bath rotary, model F.E.
2—Gardner-Denver power pumps, 7¼ x 14 oil bath roller bearings, excellent condition.
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subdvn Copita Farm and Garden trs, Santos Garcia Gr A-1985, Pettus 5012 ft, abnd 5521 ft.

Starr County — Failure: Bishop & Moss' Pedro Lopez 1, 545 fr wl 467 fr sl 86-ac lse sh 37, Jose Salvador de la Garza porc 88, elev 306 ft, abnd 2813 ft.

Starr County — Gas Discovery: T. E. Stephens' M. Hinojosa et al 4, 1840 s of nl 4767-ac lse 8600 ne of interior cor of sw side of lse in porcs 109-111, sh 1, perf 2063-68 ft, 2040-62 ft, flow gas, 1/16-in, no gge, td 2096 ft.

LOWER TEXAS COAST WILDCATS

Bee County—Discovery: Dirks Bros.' D. E. Robinson A-1, 990 fr w&nl sect 6, 160-ac lse, sw¼ sect 6 Ragley subdvn elev 331.6 ft, flow 38 bbls, gas lift, td 3938 ft.

Bee County—Failure: Herb E. Dirks et al's F. Goree 10, 660 fr ne&sel 200-ac tr out of 414.7-ac lse, Thos. E. Barton sur A-83, in blk 38, abnd 7766 ft.

Brooks County — Dan Sullivan Discovery: Sun's Dan Sullivan et al 1, 8300 fr wl 19,500 fr sl "El Tule" A. Garcia Gr on 15,732-ac lse, sd 8508 ft, perf 8508-17 ft, flow 147.6 bbls 35.4-gr, 9/64-in, 8522 ft.

Brooks County—Failure: Texas Co.'s M. M. Lasater 1, 660 fr w&sl sect 3 2600.8-ac lse, Loma Blanca sur A-93, abnd 6850 ft.

Cameron County—Discovery: Great Lakes Carbon Corp.'s Yturria Ld and Livestock Co. A-1, 747 fr nel 803 fr swl lot 25 Santa Isabel Gr on Pure farmout, perf 5980-83 ft, flow 6 min gas, td 9473 ft, pb 5990 ft.

Dewitt County—Failure: Standard of Ohio's Andrew Kozek 1, 330 fr se&swl 85.9-ac lse 4200 fr sel 5200 fr nel of L. Y. Criswell sur A-116, abnd 8515 ft.

Hidalgo County—Failure: Seaboard of Delaware's Boston-Texas Land Trust Co. 3, 13,500 fr el 22,600 fr sl 22,469-ac lse, abnd 5510 ft.

Jackson County—Failure: Butcher-Arthur-Salt Dome Oil Corp.'s J. M. Hutcheson 1, 660 fr swl 616 fr nw&sel 71.33-ac lse, Nestar Clay sur A-13, otd 6010 ft, deepened and abnd 6545 ft.

Kenedy County—Failure: Texas Co.'s Yturria Land and Cattle Co. 1, 7000 e of wl 1980 fr sl 18,419.5-ac lse, San Juan de Carricitos Gr A-8, abnd 7810 ft.

Lavaca County—Failure: Jack Frazier et al's J. W. Lell et al 1, 620 fr wl 700 fr nl 40-ac lse, n½ of e 75 ac of L&L lse, show cond 5982 ft, temp abnd 7690 ft.

San Patricio County—Failure: W. E. Rowe-Republic Nat, Gas Co.'s Coffin 1, 330 fr se&swl 80-ac tr in E. J. McGloin sur, abnd 4920 ft.

Victoria County—Failures: Northern Ord-

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■ GEORGIA OIL REPORTS: 6 mo. sub. $6. Get posted. Keep posted. Also Base and County maps So. Ga. and North Fla. C. W. Deming, Waycross, Ga.

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nance's O. W. Schaefer 1, 750 fr nwl 1200 fr swl 404-ac lse, 4100 fr sel 11,900 fr swl W. T. Eaton sur, junk & abnd 10,249 ft.

Rowan & Hope's M. E. McCampbell 1, 2307 fr nwl 3000 fr swl 488-ac tr 500 fr el 3000 fr swl J. McConnaughty sur, abnd 4581 ft.

TEXAS GULF COAST WILDCATS

Colorado County—Failure: Superior of Cal.'s Matilda Tait A-1, 1500 s 660 e of nwc Patrick Daugherty sur A-167, sw 5164-69 ft, sso 5238-43 ft, abnd 9100 ft.

Ft. Bend County—Failure: W. J. Goldston's J. M. Moore Est. 1, 330 fr nwl 2310 fr swl George Dedrich sur, abnd 7275 ft.

Grimes County—Failure: Moore & Ahern's H. A. Bennett 1, 330 fr sly/nl 330 fr el 56.5-ac lse, A. Brown sur, abnd 5549 ft.

TEXAS GULF COAST NEW PAY TESTS

Ft. Bend County—Needville Discovery: W. L. Goldston et al's E. C. Farmer 1, 330 fr swl 1400 fr nwl 250-ac lse, R. Hodge sur, recomp 16 shots 6445-49 ft in Frio, flow 77 bbls 29.5-gr, otd 5196 ft, td 6706 ft.

Galveston County—Hitchcock Deep Failure: McCarthy-Phillips-Stewart's No. 1 (Setwart's Fee 14) 660 nw at ra in Texas City Terminal RR 660 nly at ra to State Highway 6, orig comp for 486 bbls 29.2-gr, ¼-in at 5132-43 ft; McCarthy deepened to 12,585 ft, sw, pb and recomp 5200 ft, perf 5139-46 ft, flow 66-16 bbls 29.3-gr, 20% wtr, 7/64-in.

EAST TEXAS BORDER COUNTIES WILDCAT

Panola County—Failure: Columbia Carbon Co.'s Julia Baldwin 1, start swc J. S. Baldwin 97-ac tr, A. Barre sur, go 90 sw alg sel sur 660 ft th se at ra 660 to lcn in G. Glass sur, elev 243 ft, Pettit 5950 ft, Travis Peak 6360 ft, abnd 6500 ft.

EAST TEXAS WILDCAT

Bowie County—Oil Discovery: Barnsdall Oil Co.-Sohio's Heilborn 2, 388 ft snl 696 ft ewl of s-47 ac of 97-ac tr, 500 ft nsl 8350 ft wel M. H. Janes sur A-304, 5½ mi sw Texarkana, Eylau prospect, 880 ft w of 7836-ft failure, elev 305 ft, Comanche 2750 ft, Goodland 2915 ft, Paluxy 3020 ft, Glen Rose 4185 ft, massive anhydrite 4503-4633 ft, Pettit 5242 ft, Travis Peak 5320 ft, Cotton Valley 6230 ft, Buckner 7457 ft, Smackover 7657 ft, gas-dist pay 7686-96 ft, flow 155¼ bbls 41.4-gr, natural, ¼-in, gas-oil ratio 8050/1, perf liner 7710-14 ft, td 7716 ft.

NORTH TEXAS WILDCATS

Archer County—Failures: Cochran & Cain's Anderson 1, 650 ft snl 150 ft wel sec 19, South Anderson Ranch subdvn, abnd 1369 ft.

Wayne King-S. W. Petre's Joe Levy 1, 950 ft nsl 450 ft wel of e-320 ac of C. K. Simmons sur A-391, abnd 1850 ft.

Wayne King-S. W. Petre's Joe Levy 1-A, 1700 ft nsl 800 ft ewl C. A. Smith sur A-1154, abnd 1261 ft.

Clay County—Failure: W. J. Price et al's Bevering 1, 500 ft snl 1500 ft ewl BBB&B Ry., J. R. Newcomb sur A-367, abnd 450 ft.

Cooke County—Failure: G. E. Kadane & Sons' Cartwright 1, 330 ft out swc of 310-ac tr, blk 3-A, B. J. Thompson sur A-1006 ft, Ellenburger 2000 ft, abnd 2170 ft.

Jack County—Failure: Hanlon & Buchanan-Greggtex Gasoline Corp.'s Hensley-Martinez 1, 1650 ft ewl 3187 ft snl of Thos. Martinez sur A-386, elev 1251 ft, Ellenburger 5956 ft, abnd 6156 ft.

NORTH TEXAS NEW PAY TEST

Cooke County—Big Indian Failure: Sinclair Prairie's Kitchens 1, 330 ft out sec lot 9, Fannin CSL sur, A-1214, elev 804 ft, Winger 5426 ft, Simpson 5730 ft, Ellenburger 6476 ft, abnd 6525 ft.

WESTERN CANADA WILDCATS

South Alberta Plains—Taber: McLeod Oil's Noble 1, lsd 14 33-8-17w4th, Kirkoff ss 3215 ft, Taber ss 3251 ft, Ellis ss 3340 ft, abnd 3364 ft.

Armelgra: Imperial Oil's Imperial-Armelgra 2, lsd 1 23-13-14w4th, abnd 3360 ft, 10 ft in Madison lime.

United States Wildcat Starts

CALIFORNIA

Contra Costa County: Shell's Jacuzzi 1, sw sw sw 34-2-2, Neroly area gas test, lcn.

Kern County: Richfield Oil Corp.'s Cottonwood-Olcese 1, nw ne sw 20-29-30, East Edison area, lcn.

Shell Oil Co.'s KCL-B 45-27, ne ne sw 27-30-26, Canfield Ranch area, lcn.

Los Angeles County: Charter Oil Co.'s 1, ne ne se 18-5-16, Castaic area, mim.

Santa Barbara County: Selbar Oil Co.'s Wardman Comm. 1, ne sw ne 3-3-10, Brea Canyon area, lcn.

Solano County: Standard of Cal.'s Suisun Comm. 4, ne se 5-3-1, Suisun area, lcn.

ILLINOIS

Bond County: Webb's Manley 1, ne sw 10-4n-1w, lcn.

Clay County: Magnolia's Rinnert 1, ne ne ne 33-4n-8e, dr 337 ft.

Hamilton County: Phillips' Leach 1, se se se 12-4s-6e, lcn.

Jasper County: Willis et al's Fitzpatrick 1, sw sw ne 10-6n-11w, lcn.

Ohio's Burton 1, nw sw ne 24-7n-9e, dr 238 ft.

Central Pipe Line's Sowers 1, sw sw sw 7-8n-9e, lcn.

Jefferson County: Shell's Davis 1, nw ne ne 23-4s-3e, lcn.

St. Clair County: St. Clair Oil's Holliday 1, sw sw sw 30-2n-7w, lcn.

White County: Cochran et al's Powell Hrs 1, se ne nw 36-6s-8e, lcn.

KANSAS

Barton County: Vickers' Krosska 1, nec 33-20s-12w, lcn.

Decatur County: Sinclair Prairie's Bremer 1, nwc se 28-4s-28w, lcn.

Ellis County: Bridgeport's Morkey 1-C, sec 17-14s-20w, woc.

Jefferson County: Magnolia's Imus 1, se ne sw 15-10s-19e, lcn.

Kearny County: Carter's Strong 1, c nw se 27-22s-35w, lcn.

Norton County: Allen et al's Cornstock 1, swc 3-4s-23w, lcn.

Pratt County: Superior's Patterson 1, se se sw 16-28s-13w, lcn.

Hatfield et al's Grapes 1, se nw nw 10-28s-15w, lcn.

Rooks County: Sinclair Prairie's Hull 1, nwc se 26-7s-18w, lcn.

Russell County: Gore's Brack 1, sw sw ne 17-15s-12w, lcn.

Stafford County: Vickers' Radke 1, ne sw sw 30-23s-13w, dr 2875 ft.

MONTANA

Toole County: Napar O&G Co.'s Zell 1, nw se nw 6-31n-2w, Marias River dist, lcn.

Texas Co.'s Hanson 1, ne sw ne 21-33n-3e, West Utopia, lcn.

Yellowstone County: Carter's Yellowstone 1, c se se 2-6n-32e, Custer dist, bldg dk for Madison test.

NEW MEXICO

Eddy County: Engas Co.'s Pecos Irrigation Co. 1, c se sw 9-25s-28e, 6 mi nw Red Bluff, lcn 3000-ft cable test.

OKLAHOMA

Beckham County: Sinclair Prairie's Perkins 1, c se nw 11-9n-24w, c&p.

Creek County: Wilcox Oil's Watson 1, se sw 27-15n-7e, rog.

Hughes County: Eason Oil et al's Mackey Heirs 1, ne ne se 23-9n-10e, rig.

Lincoln County: Phillips et al's Dublin 1, ne ne 18-15n-4e, c&p.

Okfuskee County: Phillips et al's Saran 1, nw nw ne 14-13n-7e, lcn.

Oklahoma County: Magnolia's Talbot 1, nw nw 28-13n-4w, rig.

Osage County: Peters et al's Osage 2, sw se nw 35-20n-11e, dr 205 ft.

Mealy-Wolf's Osage 1, nw sw ne 32-23n-6e, c&p.

WEST TEXAS

Cochran County: Stanolind's E. L. Slaughter 1, 440 ft out nec labor 49, Lge 101, Jeff Davis CSL sur, 2 mi s Morton, lcn 8500-ft test.

Midland County: Humble's Mrs. O. P. Buchanan 1, 660 ft ewl 1980 ft snl of Wm. Baldridge sur No 32, 9 mi se Midland, lcn 12,000-ft Ellenburger test.

Mitchell County: Union of Cal.'s Mrs. S. Bell 1, c se nw T&P Ry. 27, blk 29, T-1-S, 2½ mi se Iatan-East Howard field, lcn 3500-ft Clear Fork test.

Pecos County: Humble's H. O. Word 2, 660 ft out sec of Mrs. E. J. Carleton sur No 601, lcn 8000-ft Ellenburger test.

Yoakum County: Honolulu Oil Corp.'s McLane-T.P. Coal & Oil Co. 1, c nw nw sec 324, blk D, J. H. Gibson sur, lcn 5500-ft San Andres test.

WEST CENTRAL TEXAS

Callahan County: L. H. Choate et al's R. D. Williams 1, 200 ft nsl 1400 ft wel sec 2977, TE&L Co. sur, lcn 800-ft cable test.

Jones County: Travis et al's A. A. McDuff 1, sw se ne sec 28, Orphan Asylum Lands, lcn 2450-ft cable test.

Shackelford County: W. S. Churchill et al's G. R. Davis 1, 920 ft nsl 220 ft wel T&P Ry. 1, blk 13, lcn 1950-ft cable test.

SOUTH CENTRAL TEXAS

Bastrop County: Phillip Boyle's Mollie Ingram 1, 330 fr wl 1500 fr nl 100-ac lse, J. Maximillian sur, lcn 2400-ft test.

Edwards County: Dan Auld's Hal & C. V. Peterson 1, 660 fr s&wl 160-ac tr, se¼ AB&M sur sect 16, blk 2 on Atlantic farmout, 5500-ft cable & rotary test.

Gonzales County: Maguire Inc.'s Lydia Sauer et al 1, 330 n of crk sl lse 330 e of wl 160-ac lse, Wm. Newman sur, lcn 2800-ft test.

Kerr County: Phillips' N. H. Wharton 1, 660 out of swc nw¼ sw¼ W. G. Wharton sur 16, lcn 5500-ft Ellenburger test.

LaSalle County: Transwestern's D. C. Reed-R. C. Storey 1, 1650 fr wl 990 fr sl w½ A. Sullivan sur 140, rur.

SOUTHWEST TEXAS

Duval County: Argo Oil Corp.'s Rufino Garcia 1, 660 fr s&el lot 3 Copita Farm & Garden trs 660 fr sl blk 3, 75-ac lse, lcn 7500-ft test.

Taylor Ref. Co.'s Antonio Caballero 1, 467 fr s&wl 17,518-ac lse, Las Anacuas Gr, dr wtr well.

Starr County: Jones & Minton's Womble & Leoney 1, 330 fr w&sl tr 5, Porc 81, sh 77-B, 357.7-ac lse, mir.

Zapata County: John B. Hardwicke's Arturo Ramirez 1, 330 fr wl 3100 fr sl N. G. Brown sur 273, lcn 2700-ft test.

LOWER TEXAS COAST

Brooks County: Shell's Guaranty State Bank 2, 1980 fr el 660 fr sl GC&SF sur 721 and of 640-ac lse, elev 241 ft, lcn 7700-ft test.

Fayette County: Phillips' Karl Rietz 1, start swc 155-ac lse, Jas. Roninson Lge, go 3500 e alg sl 330 n at ra to lcn, elev 390 ft, 3000-ft test.

Kenedy County: Texas Co.'s Yturria Land & Livestock Co. 4, 660 fr s 8655 fr m/wly/el 10,913-ac lse, San Juan de Carricitos Gr, lcn 9000-ft test.

San Patricio County: Homer Easterwood et al's F. L. Morris 1, 467 fr w&sl sw se sect 54 467 fr s&wl 120-ac lse, elev 70 ft, lcn 6000-ft test.

TEXAS GULF COAST

Brazoria County: Glenn McCarthy et al's Ida Dudley Wilson et al 1, 330 fr s&el 120-ac lse 330 n of nl of Wm. Roberts sur in John Bradley sur, lcn 11,000-ft test.

Colorado County: Superior of Cal.'s Matilda Tait 1, 2500 sw alg sl fr sec th 330 at ra to lcn on 1556-ac lse, BBB&C sur A-116, lcn 13,500-ft test.

Liberty County: Phillips' Joe and Mary Ardoin et al 1, 990 fr wl 330 fr nl sect 8 HT&B sur nw 40-ac of sect, lcn 9000-ft test.

Matagorda County: Atlantic's Denman Kountze C-2, 330 fr wl 660 fr nl 150-ac lse and lot 12, Henry Parker sur, W. Markham area, lcn 5000-ft test.

Tyler County: Atlantic's Houston-American 1, 660 fr wl 580 fr nl 471-ac lse, BBB&C sur A-139, lcn 11,000-ft Wilcox test.

EAST TEXAS BORDER COUNTIES

Cass County: Simmons et al's J. C. Frost 1, 660 n of sl 660 e of wl of 127-ac tr 660 e of wl of T. E. Tucker sur, mim.

Harrison County: Roger Lacy's Verhalen Nursery 1, 1700 fr nl 659 fr wl 147-ac tr 2380 fr swl Aaron Poe sur, dr 2245 ft.

Panola County: Arkansas-Louisiana Gas Co.'s Cummings 1, 416 f r m/sly/nl 2370 fr el M. Ivey sur, ru.

Shelby County: R. L. Holcomb's Pickering Lbr. Co. 1, 200 n of sl 600 w of el of lot 9 6100 e of wl J. W. Crane sur, dr 916 ft in sd.

EAST TEXAS

Leon County: H. J. Baker et al's C. M. Wells 1, 660 ft fr m/s/swl 1857 ft fr sel of 1271-ac lse, John Scritchfield sur, 3 mi n Normangee, lcn.

Titus County: R. L. Peveto and J. B. Stephens' W. D. Farrar-Magnolia 1, 330 ft out swc of w-100-ac lse out of 200-ac tr, Wm. Walker sur, 1½ mi nw Talco, mim.

NORTH TEXAS

Archer County: Fortex Oil Corp.'s M. H. Ingersoll 1, 1840 ft snl 1350 ft wel S. P. Ry. 1, A-434, lcn 1700-ft test.

Clay County: Continental's J. P. Welch 1, 330 ft out nwc lot 26, Freestone CSL sur, A-144, lcn Ellenburger test.

Cooke County: Humble's Anton Felderhoff 1, 990 ft snl 330 ft wel blk 3, John Barnett sur A-42, lcn 2500-ft Ellenburger test.

Kadane-Griffith Oil Co.'s S. B. Hopkins 1, 330 ft out nwc sec 18, BBB&C Ry. sur A-150, lcn 3000-ft Ellenburger test.

Texas Co.'s Ben Bengfort 1, 1750 ft snl 660 ft ewl of 120-ac lse, Timothy Jessup sur A-523, rur for 3000-ft Ellenburger test.

Jack County: Standard of Texas-Hanlon & Buchanan's F. C. Bloodworth 1, lse 2, 1400 ft out nec sec 3316, lcn 5000-ft Ellenburger test.

Hanlon & Buchanan's C. M. Matlock 1, East Bryson new pay test, 467 ft out swc of 50-ac in sw part A. H. Latimer sur A-363, lcn 6000-ft Ellenburger test.

WESTERN CANADA

South Alberta Plains—Hay Lake Nose: McColl-Frontenac Oil-British Dominion Oil's No. 12 17-1-17w4th, 12 17-1-17w4th, ru.

Taber: Imperial Oil's Imperial-Hudson Bay-Barnwell 1, lsd 15 8-9-17w4th, dr.

Imperial Oil's Imperial-Leth 1, lsd 4 27-8-16w4th, dr.

Central Alberta Plains—Vermilion: Vermilion Consolidated Oil's No. 15, lsd 6 12-49-6w4th, dr.

Squeaks from the Bull Wheel

Any Joints?

"My girl had her nose broken in three places."

"She should stay out of such places."

Watered Stock

A liquor dealer was explaining a price increase to a farmer. "We have to keep this whiskey in storage. And do you know, keeping whiskey is as expensive as keeping a horse."

"Doesn't eat as much," was the comeback, "but maybe it drinks more water."

No, Thanks

"I wish I was in the Army."

"Who doesn't?"

"The Army."

Too Oily

"State the amount of oil exported from the United States in any one year?"

"In 1492—none."

And Hurry, Please

"You can have five minutes of grace before you die."

"Okay, bring her in."

Signs

In a Chicago Servicemen's Center: "George Washington didn't sleep here, but three million servicemen have."

From England

As two elderly ladies were walking along the street they passed a couple of military policemen. One of the ladies drew the other's attention to the armlets bearing the letters M. P.

"That's what I call sensible," she said, "It's much better for them to patrol the streets than to waste their breath in the House of Commons."

Good Trick If You Can Do It

"Wash your hands."

"Both of them?"

"No, just one, I want to see how you do it."

Patient Recovered

"I hear Bill had an operation."

"Yes, they removed a brass rail that had been pressing against his foot for years."

Definitions

Golden Opportunity: A blonde.

Secret: Something you tell one person at a time.

Flirt: A girl who got the boy you wanted.

Welcome

The car's motor knocked and stopped.

"Wonder what that knock was?" mused the soldier.

"Maybe it was opportunity," she murmurred.

Unfair Competition

She: "Let's take reducing treatments. They don't cost much."

Another she: "Not me. I have trouble avoiding free rubdowns."

A Ripping Old Time

"Then an explosion tore up main street."

"Goodness! And what did you do?"

"Tore up a side street."

Joe's Complaint

"How do you like the Army?"

"I may like it after a while, but just now there's too much drilling and fussing around between meals."

Vacation Pay

Little pay check, in a day,
You and I will go away
To some gay and festive spot;
I'll return, but you will not.

—Armored News.

William M. Barret, Inc.

Consulting Geophysicists

Specializing In Magnetic Surveys

Contracts accepted for domestic and foreign projects, using the most improved instrumental and interpretative technique

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SHREVEPORT, LOUISIANA

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Analytical and Consulting Chemist
Podbielniak Gas Analysis

Oil Field Brines, Waters and Cores
Complete Evaluation of Crude Oils

Long Distance 267, Box 132, Houston, Tex.

THE FORT WORTH LABORATORIES

Analysis of oil field brines, cores, gas, oil and minerals. Field gas testing. R. H. Fash, Vice President; Long Distance 138
823½ Monroe Street, Fort Worth, Texas

Standco
NO-SMOKE

STANDCO BRAKE LINING

Is the driller's best friend because it makes the easiest brake known and "feeds off" evenly while drilling. It never scores brake rims. See page 2808 Composite Catalog.

Standco Brake Lining Co.
HOUSTON

PRECISION
INSPECTION SERVICE
NON-DESTRUCTIVE INSPECTION

- MAGNAFLUX
- X-RAY
- RADIUM

PORTABLE FIELD EQUIPMENT

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Here's the Way to More Power, Longer Equipment Life, and Lower Fuel Bills . . .
USE SAND-BANUM

"The Entirely Different Boiler and Engine Treatment"

To Automatically Remove and Prevent Scale and Corrosion in boilers and tubes that they labor less, live longer, and do more.

There is no obligation in writing us for complete details on this patented and proved product.

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NIGHT or DAY
in any Weather!

No delays when you join pipe with Dressers! Expansion and contraction automatically absorbed. Work goes ahead all along the line—night or day—in any weather.

Complete stocks at Dresser Houston Warehouse make possible fast delivery in the Southwest.

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HOUSTON WAREHOUSE
1121 Rothwell St. Sec. 16, Houston, Texas

Notes for the Equipment Buyer and User

Tester Finds Lost Scrapers

HERBACH & RADEMAN COMPANY

Herbach & Rademan Company, 522 Market Street, Philadelphia 6, Pennsylvania, is marketing the Gieger-Muller portable field testing set for locating lost scrapers in oil pipe lines.

The device is battery operated, weighs 13 pounds, and is provided with a shoulder strap for easy carrying.

Known as type GLP-214, the set is small, compact and readily portable, High voltage for the counter tube is generated by a special electronic circuit. The welded aluminum housing is 3¼ x 8 x 10½ inches. A probing unit on the end of a 5-foot flexible cable contains a Gieger-Muller counter tube to permit probing in confined spaces, in crevices and between obstacles.

By attaching a vial of radium or other radioactive material to another scraper which is sent through the pipe line and following the course of the line above ground, using the testing set, it is easily possible to locate the exact point at which the second scraper stops against the first jammed scraper. Radioactivity as low as .00002 milligram radium equivalent can be measured.

The tester uses two small "A" batteries, three small "B" batteries and one "C" battery. All radio tubes and batteries are standard type. In describing operation of the set, the manufacturer states that "when no sourec of radiation is present, occasional and random clicks are heard in the headphones, which are due to cosmic ray particles and natural radioactivity which are always present everywhere. These clicks, which occur at a rate of approximately eight per minute, serve as a simple indication that the set is operating properly. A minute quantity of radium, or a source of radium of corresponding intensity brought near the tube will increase the audible rate of the random-spaced clicks at a rate in proportion to the radiation intensity or the distance from the tube.

Portable Field Testing Set

M. F. Hampton & Company Is Name of Tulsa Partnership

M. F. Hampton & Company is the name of a partnership established at Tulsa by M. F. Hampton and Allen J. Edwards to deal in oil field specialties. Edwards was formerly sales manager of Black, Sivalls & Bryson, oil industry equipment manufacturers. Hampton has been operating a specialties business.

Hunt Tool Company Names W. J. Nutto Sales Manager

W. J. Nutto has been appointed sales manager of Hunt Tool Company, Houston. After graduating in mechanical engineering in 1922, he spent seven years in engineering and sales of mining machines and other pneumatic equipment, and then entered the oil industry as Mid-Continent manager of the oil tool division of Chicago Pneumatic Tool Company. He joined the Reed Roller Bit Company in 1933, and after a year in Oklahoma, spent several years covering all South American and Mexican fields. Then followed two years service as export manager in New York, after which he moved to Houston as assistant sales manager. For 2½ years he has been general sales manager. Appointment of a general sales manager is a part of Hunt Tool Company's expansion program which also includes enlarged facilities for the manufacture of oil field tools.

W. J. Nutto

Detroit Diesel Engine Firm Opens Office at Tulsa

Detroit Diesel Engine Division of General Motors Corporation, Detroit, has opened an office at Tulsa to serve the petroleum industry.

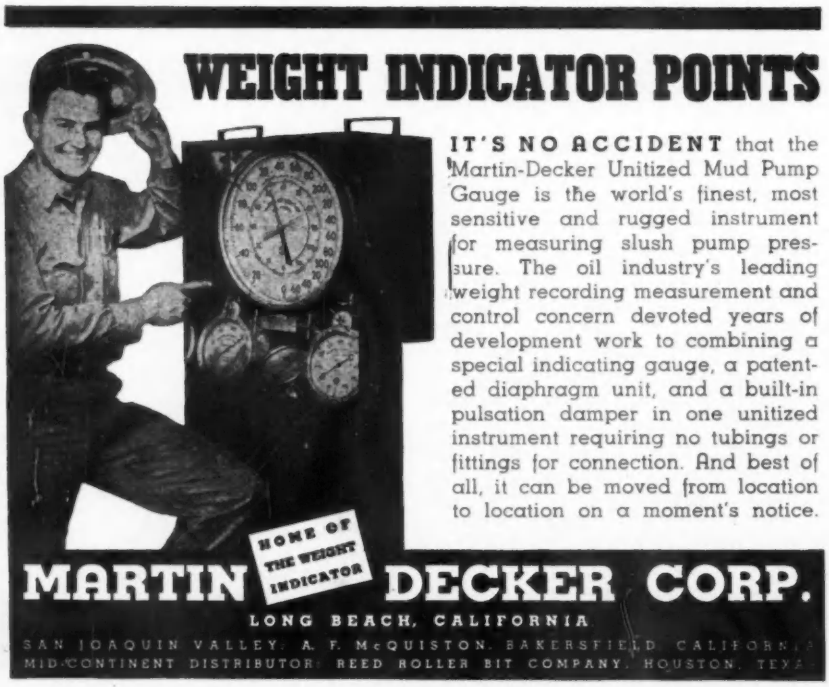
Arch F. Campbell, Tulsa, will manage the office and supervise sale of engines. He formerly was branch manager of Waukesha Motor Company, sales manager of the Superior Engine Division of National Supply Company, and more recently was associated with Clark Brothers Company.

Arch F. Campbell

Kobe Firm Consolidates Three Districts Into One

Kobe, Incorporated, Huntington Park, California, announces consolidation of its Illinois, Kansas, and Tulsa districts into one district, at 506 Kennedy Building, Tulsa. M. L. Walraven, Jr., manager of the Tulsa district, will head the consolidated office and will be assisted by E. T. Harrison, former manager of the Illinois district. The consolidation was decided upon to insure better service to users of Kobe system of hydraulic pumping.

M. L. Walraven, Jr.


WEIGHT INDICATOR POINTS
IT'S NO ACCIDENT that the Martin-Decker Unitized Mud Pump Gauge is the world's finest, most sensitive and rugged instrument for measuring slush pump pressure. The oil industry's leading weight recording measurement and control concern devoted years of development work to combining a special indicating gauge, a patented diaphragm unit, and a built-in pulsation damper in one unitized instrument requiring no tubings or fittings for connection. And best of all, it can be moved from location to location on a moment's notice.
HOME OF THE WEIGHT INDICATOR
MARTIN DECKER CORP.
LONG BEACH, CALIFORNIA
SAN JOAQUIN VALLEY: A. F. McQUISTON, BAKERSFIELD, CALIFORNIA
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HOUSTON, TEXAS
Branch at Corpus Christi, Texas

TEXAS PIPE AND SUPPLY COMPANY
INCORPORATED

RENTAL ITEMS

2" through 16" O. D. Type A Elevators
2" through 16" Regular and Extra Heavy B. J. Tong Heads
2½" through 9⅝" A.P.I. Rotary Slips
5" O. D. through 13⅜" B. J. Slip Grip Elevator
3", 3½" and 4¼" Baash-Ross Roller Kelly Drive Bushings
Crown Block, Traveling Blocks, Hook, Swivels, Oil Bath Rotaries
2½", 3", 3½" and 4¼" Square Kellys
2" and 2½" W. K. M. Deep Well Bowls and Slips

PRODUCTION CROWN BLOCKS

We can make immediate delivery of a limited number of production crown blocks with *genuine manganese* steel casing, crown and sand sheaves of any beam and sheave combination.

Anticipate your requirements and enter orders *now* for this critical manganese material.

All blocks equipped with Lucey chain-oiling journal boxes.

LUCEY PRODUCTS CORPORATION
OIL WELL SUPPLIES
TULSA, OKLAHOMA

Easy-to-read, *raised* black graduations on crack-proof white surface... resist abrasion from oil, sand, scraping on the pipe pile, etc. In all sizes and types—in cases or reels. Ask your dealer—or write for catalog.

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NEW YORK • HOBOKEN, N. J.
CHICAGO • ST. LOUIS • SAN FRANCISCO • LOS ANGELES • DETROIT • MONTREAL

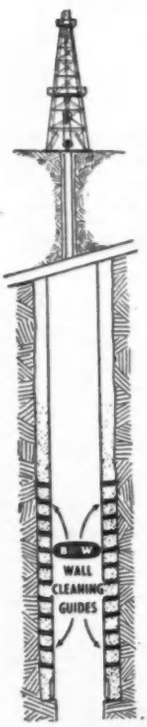
Prevent CRATERING *by using*

B and W, Inc.

Wall Cleaning Guides

ON YOUR

SURFACE CASING



1 TO PREVENT BLOW-OUTS

Wall Cleaning Guides placed on the bottom joints of surface casing protect against blow-outs around the casing, or cratering from an imperfect cement job.

2 TO PREVENT BACKING OFF

The rotation and jarring of the drill pipe tends to loosen the threads of the bottom joint of surface casing, particularly opposite an imperfect cement job. The unscrewing of this joint may result in an impossible fishing job, or abandonment.

Wall Cleaning Guides placed on the bottom joints will assist in securing a perfect cement job, which in turn will securely anchor the casing to the formation.

Table of Dimensions

Casing Size	Hole Diameter	Outside Wire Diam.
8⅝"	12¼"	14½"
9⅝"	12¼"	14½"
10¾"	14¾"	16¾"
13⅜"	17¼"	18½"

BRUCE BARKIS — B and W, Inc. — KENNETH WRIGHT

Well Completion Specialists

WEST COAST: 3545 Cedar Avenue
Long Beach, Calif. • Phone: L. B. 4-8366
GULF COAST: 305 M & M Building
Houston, Texas • Phone: Preston 9783

R. C. (CLAUD) JOHNSTON has resigned as vice president and a director of Delta Drilling Company and has organized the Comet Drilling Company of Texas, with headquarters in the Peoples National Bank Building, Tyler, Texas. The new company has two rigs running in West Texas.

GEORGE W. CUPIT, JR., of Tulsa has been named chief chemist of the motor fuels division, Oklahoma State Corporation Commission, succeeding Paul Williams, who has joined the Western Petroleum Refiners Association.

DAVID R. WILLIAMS, vice president of Williams Brothers Corporation, pipe line contractors of Tulsa, was seriously injured in an automobile accident while on a construction job outside the United States. Place of the mishap was not revealed since the work was in connection with a war contract.

RAY PEARSONS, for 8 years a field auditor with Gulf Oil Corporation, has acquired an interest in the Bert Miller Drilling Company, and will be in charge of field operations in Illinois with headquarters at Fairfield, Illinois.

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STEAM CONDENSERS
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FEED WATER HEATERS

We deliver small condensers and feed water heaters built to your specifications in days instead of weeks or months.
Call us also for expert maintenance of your condensers and feed water heaters — QUICK SERVICE.

25 Years Successful Experience

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"Service, Not Promises"
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916 S. PETERS STREET, NEW ORLEANS, LA.

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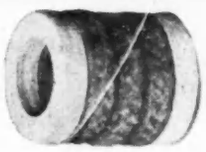
PACKINGS . . . GASKETS



Style 804

Sterling Combination set for Hydraulic water service is a very effective and long lasting packing on reciprocating pump rods. Style 804 is composed of hydraulic end rings and center rings of hydraulic jute. The solid end rings furnish a solid base for the gland to work in, compressing the softer jute against the rod, assuring a pressure tight seal.

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MEANS QUALITY

UNIBOLT
THE ONE BOLT COUPLING

COMPOUND
YOUR PUMPS

. . . the convenient, economical way. Install UNIBOLT "BIG INCH" COUPLINGS with Blanking Plugs on your pump suctions.

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HOUSTON

KEROTEST

Tomorrow...

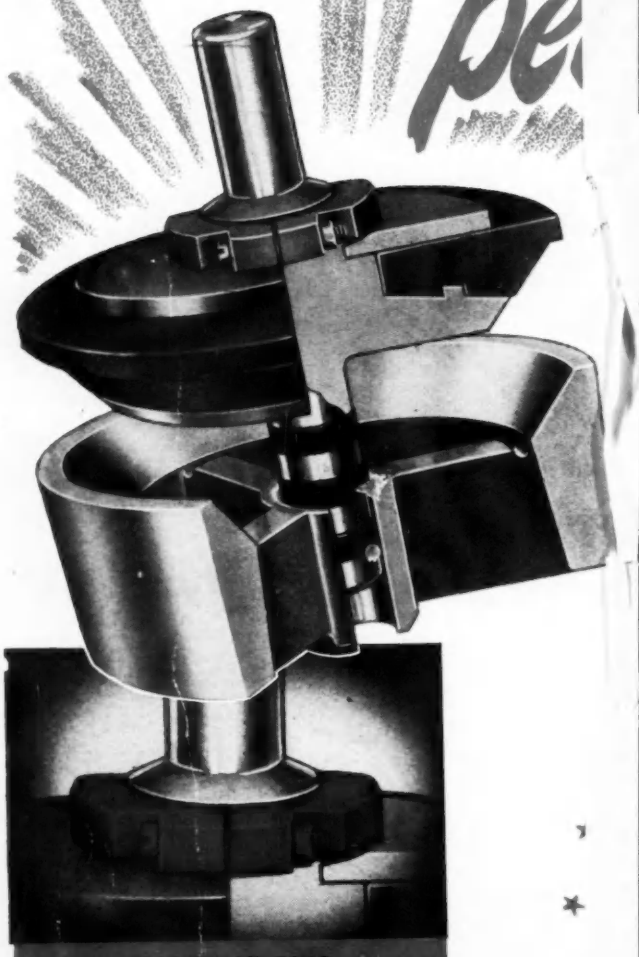
With increased demands for more crude . . . with wells going to greater depths . . . with new field developments . . . with increasing pressures . . . better valve and well control equipment will be required. Kerotest is keeping pace with operating developments and

KEROTEST VALVES WILL BE READY!

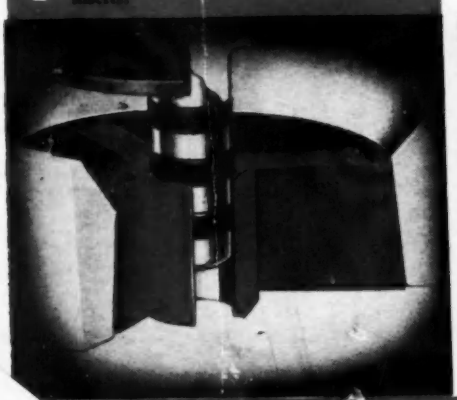
KEROTEST MANUFACTURING CO., PITTSBURGH, PA.

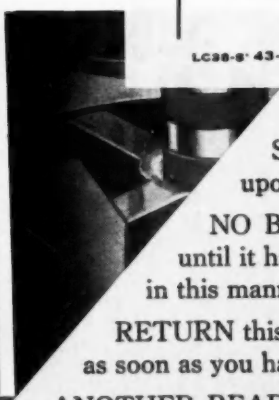
VALVES

"American" Valves and Seats are making history for long-lasting pe



1 QUICK CHANGE RING . . . . .
for holding insert and insert plate. Makes possible a speedy changing of inserts.





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. . . specially designed seat is built . . . stand the pounding of modern . . . amps. Braced from three po . . .

INSERTS . . .
. . . inserts that are . . . heavy to resist high . . . sives.

Oil weekly TP .W926

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